

The Railway and Locomotive Historical Society

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THE RAILWAY AND LOCOMOTIVE HISTORICAL SOCIETY

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In presenting the final Bulletin for the year, we wish to welcome two new contributors from our membership ranks. Prof. Charles J. Kennedy has permitted us the use of his paper read before the annual Business History Conference at Purdue University on the Influence of Government Regulation on the Management Decisions of Forty-five New England Railroads, 1830-1900. We hear so much about the railroads being over-regulated today and the other carriers not being regulated at all, that this paper, with its historical background should be of timely interest.

Another newcomer is Charles Thomas who has prepared an interesting paper of the development of the railways in and around Washington, D. C. Our Nation's Capital with the beautiful Union Station and its facilities, Potomac yard to the south is an important rail center.

We welcome back to our columns the first of a series of papers on the early railroads in the Commonwealth of Pennsylvania by Earl J. Heydinger; another paper from Prof. Elmer G. Sulzer on the Kentucky & Tennessee R. R. and Fred Jukes has furnished us with an interesting account of the Chicago & South Side Rapid Transit Co. The final installment on the wooden passenger equipment of the New Haven R. R. appears in this issue and a paper read before our Southern California Chapter by Mr. J. G. Fry, Chief Engineer, Coast Lines, A. T. & S. Fe Ry. is reproduced herewith. In this wide variety of railroad subjects your Editor hopes that each member will find something of interest.

The Influence of Government Regulation on the Management Decisions of Forty-Five New England Railroads, 1830-1900*

BY CHARLES J. KENNEDY

How and to what extent were the decisions made by railroad managements in the United States influenced by government regulations and government officials?

We need the answer to this question especially to understand the transition from unrestricted entry to regulated competition in the railroad industry, to appraise the management record of the firms in that industry, and to widen our understanding of the relation between business and government. The answer to this question also can be useful in learning how and why government regulation of railroads was introduced and expanded, and in learning what effect government regulations have had upon the users of the railroad and the economy in general.

In our opinion, a most satisfactory way to obtain an adequate answer to the question before us is for business historians to include it as part of an overall study of the administration or management history of a railroad. While preparing such a history of the railroads that later became the Boston & Maine Railroad System, we found a number of items of information and made conclusions based on that evidence that we probably would not have found or recognized if engaged only in a search for material strictly applicable to the title of this paper.

We are presenting in this paper the pertinent evidence that we found concerning the influence of state and federal regulations before 1900 upon the management decisions of 101 steam railroads separately constructed and located largely in New England, all of which are now included in the Boston & Maine System. Since fifty-six of those companies never operated their own properties but leased them or merged the corporations with other railroads, their management histories, we feel, are too brief to be recognized in the title. Only fifteen roads were relatively large, operated independently for some time, and managed by men whose purpose was to perform the function of transporting persons and commodities in larger volume at lower rates over an expanding network. The other thirty roads were smaller, usually operated independently for only a few years, and managed by men who began with,

* This article is an excerpt from a history of the Boston & Maine Railroad, now being prepared by the author.

This paper was read at the Business History Conference, February 18, 1961, and is based upon a forthcoming volume on the history of the Boston and Maine Railroad and its 44 constituents. The Research Council of the Graduate College, University of Nebraska, assisted with the microfilm purchase of certain periodicals used in the preparation of this article.

or eventually accepted, the purpose of securing a good bargain in the form of a lease or sale of their properties to a larger and stronger railroad.

We shall present our findings, first, with a summary for the period from 1830 to the mid-sixties, and then with a separate explanation of the early construction of the Hoosac Tunnel during the late 'fifties and early 'sixties. For the last third of the nineteenth century we will group the material under four topics: safety regulations, the transportation of milk, regulations on other rates and services, and the construction of the first North Station in Boston.

The year 1900 is significant only because all of the forty-five independently-operated roads shown on the appended lists were merged into, or leased by, the Boston & Maine Railroad by that date. There was no major development of government regulation in that year.

1830 THROUGH THE 1860's

During the period from 1830 to the late 1860's, there were a number of regulations stated in the charters, in scattered statutes of state legislatures, and in the common law. For the most part, however, the important decisions by the various managements of the railroads in this study, as far as we could tell, would have been made, as they were made regardless of the government.

One exception pertained to capital stock and debt. Generally, the state required that a certain amount of the authorized stock be *subscribed* by a specified date or before the beginning of construction. The records of several roads reveal the extra effort necessitated by the promoters to obtain the required subscriptions.

Another regulation, adopted in 1852 in Massachusetts, required that twenty per cent of the stock be paid into the company's treasury before the construction could begin. The intention was to prevent the building of a road financed so extensively by credit that, if the contractor failed, the railroad also would collapse. The requirement did not achieve its purpose, however, until more stringent state legislation was passed in the 'eighties. How the Troy & Greenfield management by-passed this regulation in the 'fifties will be explained when we discuss the Hoosac Tunnel.

Nearly every railroad borrowed some funds to pay its construction bills. The amount of short-term debt was unlimited. Some of the notes ran as long as three years and were renewed by the issuance of new notes. Massachusetts regulations—which were more restrictive than those of Maine, New Hampshire, Vermont, and New York—prohibited railroads from issuing mortgage bonds except for the few companies which received special permission in their charters or amendments to the charters. This was changed in 1854, when all Massachusetts roads were permitted to issue bonds equivalent to the amount of stock actually paid into the company's treasury. All but two of the fifteen major roads reduced their debt by the 'sixties, as it was considered imprudent management for a New England railroad to have a

large debt. Some of the smaller companies, on the other hand, did become insolvent, and perhaps the number would have been larger were it not for the mild regulation discouraging a large debt.

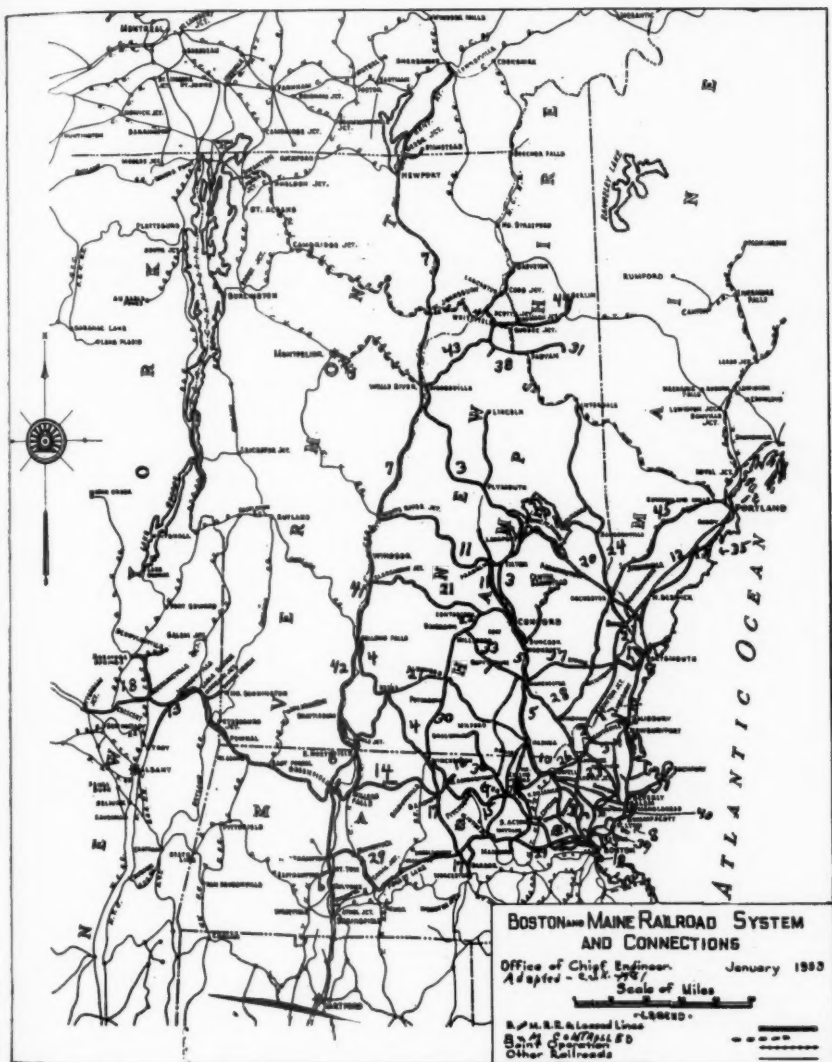
Besides the 101 separately constructed railroads and a number of franchises acquired by those roads, in the same area, there were at least seventy-four other roads chartered which were never constructed nor their franchises acquired by an operating road; but the reason was financial weakness, not restrictive government regulation.

Before the late 1860's, there were a number of regulations that one might expect would have influenced decision-making of the railroad leaders, such as the number of shares one stockholder could vote, a restriction on rates, requirements to interchange cars and divide the rates, the obligation to follow a shipper's routing instructions, and the exclusion of all competing roads within the immediate territory of four specified railroads.

Actually, their influence was very limited. The restriction on a shareholder voting more than one-tenth of the outstanding stock, even though he might own a larger amount, did not affect any of the roads in our group. No one needed that much to maintain control. Also, the earnings of the best roads were not so attractive that anyone desired to own more than ten per cent of the stock.

The restriction on rates was indirect. If, after a period of four or five years, the net income from a railroad amounted to more than ten or twelve per cent upon the total cost of construction, the legislature reserved the right to require the rates be reduced to take off the "over-plus" the next four years. Although six roads paid ten per cent dividends for four or more consecutive years, only the Concord Railroad was in position to pay larger dividends. All but one of the forty-five operating roads in this study, when they had funds, charged certain improvements to operating expenses, thereby eliminating practically all of the surplus that otherwise would have remained after payment of dividends. Apparently, that was not done to avoid the government regulation that would have required the reduction of rates, but was a practice considered to be prudent management. Incidentally, it was wise, in that the managements were able to improve and extend their facilities in advance of potential traffic bottlenecks without arguing with stockholders who, at that time, insisted on dividing essentially all of the balance after paying operating expenses and fixed charges.

An important feature of railroad operation in early New England was the universal practice of interchanging cars between connecting roads and the division of rates between the railroads, so that shippers from the beginning of the railroad era enjoyed through routes and through rates. The only exceptions were the Grand Trunk with its extra wide gauge, and an occasional exemption permitted by a legislature to protect a small road from the competition of a larger road. The early charters provided that one road could enter with its cars upon another road, and general legislation at a later date restated the obligation. If a price (a division of the rate charged the shipper or traveller)



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was not mutually acceptable, it was set by arbitrators appointed by the government. Only on a few occasions was the government called upon to appoint arbitrators.

Related to the interchange of cars was the obligation of a railroad to forward a shipment by the connecting railroad designated by the shipper, or carry a passenger via the connecting road of his choice. This regulation was important because of a series of pooling contracts, whereby one or more roads would be excluded from through traffic arrangements, except, as the law required, those shipments designated by the shippers and those passengers specifying a routing via the roads excluded from the arrangement or pool. Because of that particular government regulation, the designers of pools devised special formulas to control the flow of traffic and profits.

Another type of legislation influenced the decisions of a number of promoters, who wanted to construct railroads or branches that would compete with the Boston & Lowell and/or the Concord railroads. The charters of those roads, as well as the Nashua & Lowell (N.H.) and the Boston & Maine (N.H.), excluded competitors for thirty years from building parallel roads within five miles. This protection for the Boston & Lowell still required some vigorous legal action to make the law effective. Just before the expiration of the thirty-year monopoly, the Boston & Lowell management purchased the Salem & Lowell to maintain the monopoly previously provided by the charter.

A rather unexpected regulation applied to two roads, the Boston & Maine and the Eastern, during the 'fifties. The Boston & Maine was required to operate a specified number of trains over a branch road that it wanted to lease. The legislature made the requirement as a condition for approval of the lease. The same requirement was made upon the Eastern in a similar situation. The branch trains constituted an above-the-rail loss to the operating roads. If it were not for this special regulation, at least the Eastern Railroad, anxious to eliminate competition from the branch road, probably would have dried up the traffic completely.

The other restrictions in the early railroad charters and statutes were not particularly influential beyond routine regulation. For example, a railroad had to be located within the general area described in the charter; the incorporators had to organize the company with directors, who, in turn, would elect the officers and conduct nearly all of the business; and the road had to be completed by a specified date unless an amendment was obtained to extend the date, which was easily done. Fences had to be erected by the railroads, and crossings of private ways, highways, and canals had to be provided and maintained at the railroad's expense. The safety regulations were very meager. Engine bells had to be rung at crossings, signboards erected, and, in certain cases, gates also provided. A "know-nothing stop", adopted by the Massachusetts legislature in 1855, will be explained as part of the history preceding the erection of the North Station.

THE HOOSAC TUNNEL

In the 1850's, construction was commenced on the Hoosac Tunnel, which we will recount to show how certain government officials influenced an important decision of a private management—the decision to sacrifice an investment and let the state itself build the tunnel and adjacent railroad.

The 42-mile Troy & Greenfield Railroad and its 4½-mile* Hoosac Tunnel was not only the most expensive railroad property in New England, but, the tunnel was the longest in the United States. The Troy & Greenfield was authorized to issue \$3,500,000 capital stock. Since no significant portion of that amount could be obtained from private investors, the legislature in 1854 agreed to loan \$2,000,000 at 5 per cent interest, the first \$100,000 of the loan to be available only when \$600,000 stock had been subscribed, with 20 per cent actually paid in, and when 1,000 feet of tunnel and seven miles of railroad had been completed.

During the next few years, E. W. Serrell & Company, an inadequately financed and very poorly managed construction firm, stumbled along until the partners were able to induce Herman Haupt to join them. An engineer, author, inventor of a type of bridge construction, and an able railroad executive in Pennsylvania, the thirty-nine year old Haupt had had considerable experience in railroad and tunnel construction. His reputation as an engineer and contractor was excellent.

Haupt became a partner in the Hoosac Tunnel project primarily for an opportunity to test and to perfect a power drill that he was inventing. He set up a trust fund for the care of orphans to be supplied by all of his profits from the construction. Unfortunately, Serrell made a number of unwise financial obligations for the partnership. To save his own credit, Haupt finally bought out Serrell at a high price, thereby acquiring a controlling interest in the Troy & Greenfield Railroad, since the railroad had used stock to pay for some of the construction. For all practical purposes, the Troy & Greenfield Railroad was insolvent but Haupt maintained the fiction of the corporation in order to borrow from the government. It was essentially Haupt's personal funds and personal credit that made it possible during the next few years for the railroads to continue construction and to obtain installments on the state loan.

Haupt's miners made slow progress by toiling away with their sledges and hand drills and blasting with dangerous gunpowder, but he finally met the specifications of the loan by excavating a 14x18-foot hole, a thousand feet into the eastern side of Hoosac Mountain, and providing the railroad with the required cash for stock subscribed and paid in. To accomplish the latter, he borrowed \$100,000 in bank bills and handed them to the treasurer of the railroad; but Haupt did not release his grip upon the package! The treasurer credited Haupt with a payment of \$100,000, equal to 20% assessment on 5000 shares he or

* Portal-to-portal length is 25,081 feet.

his partners had received as part payment for their work. The same currency was then paid to Haupt to apply on the amount due his company for work already performed. This procedure in obtaining "cash" to meet the loan requirement was legal and accepted as such by the Attorney-General of Massachusetts, an official, incidentally, who did not like Haupt.

There were a number of foes to the tunnel project, including supporters of the Western Railroad, which furnished the only rail service across western Massachusetts. Although they were able for some time to discourage Haupt, they opposed him and perhaps were responsible for certain provisions in the amendment to the loan act in 1860. According to the amendment, installments on the loan were not to be made unless Haupt's work was "substantially performed," presumably to the satisfaction of the state engineer appointed by the governor. The provision was indeed ambiguous.

When John Albion Andrew became governor, he wanted the incumbent engineer to resign in favor of an engineer of his own preference. The state engineer refused to resign; Andrew refused to certify his recommendation for payments of the loan to Haupt; but, the governor's council overruled Andrew and Haupt was paid. Finally, Governor Andrew ousted the hold-over engineer and appointed a man of his own choice. That man made a perfunctory inspection of the Troy & Greenfield Railroad, never entered the tunnel, and recommended that the governor refuse a pending installment of the loan. He contended that Haupt's grading of the roadbed outside the tunnel did not meet the specifications which he, the new state engineer, established, although Haupt had graded the roadbed in accordance with the practice of other leading construction engineers. Governor Andrew, inaccurately informed by Haupt's enemies that Haupt was making a huge profit, refused payment to Haupt, without realizing that the state engineer's report was not only incomplete but biased.

Years later, Andrew publicly admitted his mistake, but meanwhile, events occurred that could not be undone. With the installment of the loan denied him, Haupt's credit was ruined and he permanently terminated his construction work on the Troy & Greenfield Railroad and the Hoosac Tunnel, on July 1, 1861.

Thus ended the state's opportunity to have the project constructed with the taxpayers providing a loan of only a few million dollars at 5 per cent. Haupt's idea was to make the tunnel large enough for only a single track (as called for by the provisions of the state loan) and thereby prove to the public the feasibility of the tunnel and attract sufficient support from various capitalists to eventually finish a double track tunnel. Haupt's private papers indicate that all but one point in his plan undoubtedly would have worked, provided the state officials had been cooperative and increased the loan by an amount to offset the inflation of the 'sixties. The one uncertainty, in my opinion, was his expectation that private capital would be obtainable when he had made a hole through the mountain. Yet, he might have made it. Before Governor Andrew's blunder, the state certainly had made a marvelous

bargain. Haupt was excavating the tunnel so economically that he could have opened it for a single track for much less than the state loan of \$2,000,000, if paid in 1860 dollars.

Instead, the state proceeded to hire its own personnel to work on the project, and eventually turned the task to the Shanly brothers who did much of the work. Finally opened in 1875, the total project cost the Commonwealth more than \$15,000,000.

The story of the Hoosac Tunnel construction demonstrates how the unwise use of an ambiguous regulation in the hands of an inept public administrator, constantly pressured from biased opponents to the project could cause a construction firm to decide to withdraw from a project. In this instance, the taxpayers ultimately paid several times more for the completion of the railroad and tunnel than they would have, if the management of the project had remained in the hands of Herman Haupt.

SAFETY, 1860's-1900

During the last few years of the 1860's, railroad managements and a number of legislators expressed an interest in increasing safety on the railroads. The managements, desiring to maintain profits, hesitated to invest heavily in new safety items until their superiority and economy had been proved. For example, as late as 1869, many freight cars in northern New England had no kind of brake. That year, a Massachusetts law necessitated the rapid installation of hand brakes, not only on cars owned by Massachusetts corporations, but on cars from New Hampshire and Vermont roads used in Massachusetts for through traffic.

Greater concern about safety was soon forced upon the railroads by pressure exerted by the Massachusetts Board of Railroad Commissioners (installed in 1869, and dominated for ten years by Charles Francis Adams, Jr.) and by the public reaction following the terrible Revere disaster on the Eastern in 1871. Following the accident, the commissioners urged a number of improvements, but the railroads adopted only a few changes in procedure. Incidentally, Adams, himself, was opposed to many proposed government regulations as being an infringement upon the prerogatives of management. Actually, the managements did make some progress without government regulation, although we have time to list only the cases where safety features were adopted because of government officials.

The substitution of steam heat from the locomotive for stoves in the passenger cars was opposed by many railroad executives in the United States during the 'seventies as impractical or too expensive. In 1882, the Massachusetts legislature required improved heating apparatuses as specified by the state's railroad commissioners. Twenty-four types of stoves and systems were approved during the next few years. The commissioners were willing to move ahead rapidly toward the required adoption of steam heat from the locomotive, but the legislators listened to the protests of the railroad officials. After a serious accident, made more horrible because of the fires spread from upset stoves, the Massachusetts legislature promptly outlawed individual stoves in passenger

cars after November, 1892, except as specifically authorized by the state railroad commissioners on a few local trains. Not only the Massachusetts railroads, but the Maine, New Hampshire, and Vermont railroads, complied with the Massachusetts law, because of the extensive interchange of cars.

The air brake and the automatic coupler were the major safety appliances adopted in the nineteenth century. Without government requirements, the major roads in this study had adopted the Westinghouse straight air brake, the vacuum brake, or the Creamer brake on some of their passenger trains by 1874. When Westinghouse introduced his quick action air brake in 1887, the various roads slowly adopted it for their passenger trains. Even slower progress was made on the freight cars, because the expense of installing air brakes was a waste of money unless freight cars of all roads were so equipped, since the interchange of cars was so extensive.

A similar problem plagued the executives and the government commissioners with regard to automatic couplers. There was no one outstanding invention like Westinghouse's air brake. Of more than 4,000 car couplers patented, various state railroad commissions and legislatures in the United States approved thirty-four of that number. There was room for only one type of coupler, upon which the Master Car Builders' Association agreed, but which they could not persuade all railroads to adopt. When the state governments were unable to agree on the subject, the Massachusetts commissioners initiated a movement that culminated in a federal law, in 1893, requiring all cars and locomotives in the United States to be equipped with uniform train brakes and automatic couplers. Most managements then adopted a program to add the improvements to their equipment. By 1900, the roads in this study and most of the roads in the United States had complied.

Another safety appliance adopted by some roads only after government legislation was the adjustment, filling, or blocking of frogs, switches, and guard-rails. The Massachusetts law was passed in 1886.

Other government regulations, concerning safety, influenced management decisions only slightly, such as maintaining certain records about the bridges, requiring color-blindness examinations for train crews, and the installation of grab irons on all cars.

REGULATION OF MILK TRANSPORTATION

The regulation of rates and services in New England during the nineteenth century was limited. The Massachusetts and New Hampshire legislatures delegated authority to their state railroad commissions to set rates on only one commodity—milk—in small shipments. The circumstances were peculiar to the Boston area.

In the 1840's a practice developed whereby various roads awarded milk contractors the exclusive right to ship milk to Boston in special cars. In those agreements, the railroad agreed to refrain from contracting cars to competitors shipping from the same railroad stations. There was no provision for the shipment of single cans of milk. In the New York City area, on the other hand, the railroads ran daily milk

trains and performed all services in delivering milk to consignees in the city, whether in single cans or in hundreds of eight-quart cans.

The first action of the Massachusetts legislature affecting milk transportation was the enactment of a statute, in 1867, requiring the railroads to provide equal and reasonable terms, facilities, and accommodations for the transportation of persons and property. The New Hampshire legislature followed with a similar statute. It was understood that railroads could continue their "special contracts" with the milk contractors. Equal terms and accommodations did not mean that a railroad had to carry single cans of milk. The Act of 1867 made no changes in the actual practices in the transportation of milk. Although it restricted railroads from granting exclusive privileges or rates to any one large shipper, there was only one milk contractor desiring to ship from any one station.

In the early 'seventies, some of the milk producers, living along the line of the Fitchburg Railroad, became dissatisfied. Only one contractor purchased milk at any one station along the line, and the Fitchburg, like other Boston roads, refused to accept small shipments of milk. The milk producers protested to the railroad commissioners and immediately had a sympathetic hearing. The commissioners favored the New York type of arrangement which, if adopted in the Boston area, would break the monopoly of the contractors. The Fitchburg management opposed the suggestion, however, claiming that it would destroy their business. During the hearing, a solution was found satisfactory to both the commissioners and the milk producers. The milk contractors agreed that in addition to their original capacity of buying and shipping on their own account, they also would ship cans for other individuals and deliver them to the Boston consignees specified by the producers. This arrangement was enforced by a new clause in the railroad milk contracts and became known as the New England system. The commissioners at that time did not have authority to set the rate, but they did recommend a schedule of rates, varying according to distance, for cans in small lots. The Fitchburg Railroad voluntarily adopted the tariff as well as the provision for contractors to handle cans for small shippers.

Five years later, some milk producers filed further complaints. They maintained that the contractors, hauling the milk of independent producers on consignment, were oppressive, exacting, and still enjoyed a practical monopoly by their favored position of knowing to whom each independent producer was selling and the quantity he shipped. The Massachusetts railroad commissioners felt that any producer was entitled to get his produce to the consumer in his own way, and that the business of the railroad was simply to give him and everyone else reasonable and equal transportation terms and accommodations. The remedy, said the commissioners, was to break up the contract system and have the railroads operate their own milk cars, as in the New York City area.

When the Boston railroads would not accept the suggestion, the commissioners turned to the Massachusetts legislature. There, the railroad leaders succeeded in blocking the basic recommendation of the commissioners, although the legislature and governor enacted a Milk Act

in 1879, which the New Hampshire legislature also adopted two years later. These acts authorized the railroad commissioners to revise any rate for the shipment of milk in small lots so that it would be reasonable in relation to the contract rates on large shipments. This, the railroad managements did not mind. They retained complete control of the rates in special contracts and they were not required to handle small-lot shipments themselves; such service could be performed by the contractors as theretofore.

The Massachusetts commissioners took a very limited view of their rate-setting powers. When some farmers at one of the Fitchburg Railroad stations complained that a milk contractor's charge of an extra cent per can for icing during warm weather was excessive, the commissioners replied that nowhere did the law mention ice or a charge for such service, and that, although icing was necessary, it would be "a violent straining of language" to hold that railroads were required to see that contractors provided icing at reasonable prices. Fortunately, the contractors, with the Fitchburg's approval, volunteered to reduce the charge for ice to one-half cent per can, which satisfied both the producers and the commissioners.

Nine years later in 1891, the Massachusetts railroad commissioners reversed their decision and held that under the Milk Act of 1879 they did have authority to regulate rates on both the transportation and the icing of milk in small shipments, although they could not *require* that icing be furnished. The commissioners, in this case, ordered the Fitchburg to lower its rates to 3 cents a can with no extra charge for icing, making the total charge about 25 per cent higher than the carload rate paid by contractors. The Fitchburg officials refused to lower their rate and were sustained by the courts for technical reasons of inadequate procedure followed by the commissioners in issuing the order. Nevertheless, while the case was pending in the courts, the management, on second thought, "voluntarily" reduced its rate to 3 cents a can.

Two years later, milk producers again petitioned the Massachusetts legislature to break what they called the milk monopoly. Their influence was too weak. The Milk Act of 1893 amended the earlier act only slightly and permitted the railroads to retain the so-called New England system.

The only departure from that system, as far as we know, was the service offered by the Boston & Maine Railroad on branch lines where no contractor had leased a car for daily service. On such branches, the railroad employees serviced milk in one end of a baggage car fitted with cupboards and facilities for heat or ice.

The Massachusetts and the New Hampshire commissioners continued to regulate milk rates upon complaints by shippers, for lots of less than 100 cans, until this unique system was discontinued in 1908.

OTHER RATES

During the nineteenth century, the other regulations of rates and services which especially influenced the management decisions of the forty-five roads in this study, concerned the workingmen's trains, short-haul freight rates, and restriction against personal discrimination.

Legislation requiring especially low commuter fares was primarily the result of agitation by Josiah Quincy, an erstwhile railroad executive who championed numerous railroad causes. Unable to obtain the co-operation of the Boston railroads or the Massachusetts legislative committee on railroads to adopt an European idea of workingmen's train or penny trains, Quincy, nevertheless, maneuvered a bill through the two houses in 1872. The act required every road terminating in Boston to operate a special commuter train or car upon petition of 200 persons, the train to arrive in Boston about 6 A. M. and depart about 6 P. M., with annual season tickets averaging not over 5 mills per mile for a minimum of 600 rides per year. This rate of fare was only one-half to two-thirds of the other season ticket fares. Four of the Boston roads reluctantly operated the prescribed "cheap train" or "workingman's car," maintaining that the fare was unremunerative. The number of commuters patronizing the new service was small, undoubtedly because the schedule presented by the law satisfied only a few commuters and the special trains were slow, with poor, unkempt equipment. In 1900, the Massachusetts legislature specified that upon petition each Boston road should furnish workingmen's cars upon two trains each morning and evening.

Meanwhile, the railroad managements introduced mileage tickets at attractive rates to stimulate travel over their entire systems. The Boston & Lowell was the innovator, in 1870, the Boston & Maine followed a few years later, and by the 'nineties each large road terminating in Boston had adopted the popular ticket. The price of the mileage book averaged a little more than two cents a mile, which was less than the price of the regular tickets. In 1892 the Massachusetts legislature required that the maximum price of the mileage books be only two cents a mile and that the tickets be interchangeable among all roads in the state. The railroads appealed to the courts which declared the law unconstitutional.

One of the most influential state statutes pertaining to freight rates was the long-and-short-haul law. The first such statute in New England was enacted by the Massachusetts legislature in 1871. It prohibited the freight rate for short hauls to exceed the freight rate for long hauls originating from the same point of departure and being shipped in the same direction over the same route. It was the intention to apply this restriction to interstate traffic, such as grain and coal shipped into Massachusetts. The Board of Railroad Commissioners of Massachusetts, in 1885, maintained that no law in the state was more thoroughly enforced than the short-haul law and that, indeed, "it would be more correct to say that, instead of being enforced at all, it is universally acquiesced in and obeyed."* Although the complaints against the railroads were very few, the railroad managements obviously were influenced by the requirement. When the Interstate Commerce Act was passed, the long-and-short-haul section of that act, as actually applied in the nineteenth century, directly affected a small amount of traffic in northern

* Mass. Sixteenth Annual Report of Board of Railroad Commissioners (1885), p. 49.

New England and influenced the railroad managements to expand the territory to which Boston rates on western traffic applied.

Although state statutes requiring equal terms and accommodations, did not change the practices of railroads in the transportation of milk, they did have some effect on other traffic, especially in Massachusetts. For several decades, that state had been peculiar in not accepting the common law by which a railroad corporation is forbidden to discriminate, subject to certain exceptions, such as quantity shipments. In 1867, however, the legislature required the railroads to give "reasonable and equal terms, facilities, and accommodations" to all persons or companies. There is little indication that the forty-five roads in this study needed to change their practices in meeting the new requirements. The several textile mills located in southern Maine and southeastern New Hampshire, for example, each received exactly the same rate to and from Boston. It appears likely, however, that the reason was the potential water competition and the rivalry of the Boston & Maine and the Eastern railroads in the early 'seventies, rather than the Massachusetts Act of 1867. The law did prevent some personal discrimination that otherwise would have occurred in southern Massachusetts because of the pro rata system of interline rates. Also, the Interstate Commerce Act's provision prohibiting discrimination between shippers or receivers within the same community buttressed the state legislation.

The other rate and service regulations, state and federal, seldom brought changes in the railroad practices. Two regulations, in this connection, are especially interesting. The federal prohibition of pooling in freight transportation did not affect the roads in northern New England, because, by the time the Interstate Commerce Act was passed, the chief pooling agreements had expired with the combination of a number of the roads under the Boston & Maine management. Another type of legislation, which likewise had no real effect during the nineteenth century, was the action of the New Hampshire legislature in 1883 and 1889, which specified that, thereafter, the roads in New Hampshire that united by lease or otherwise could not increase their rates. Several railroads did combine their operations under those acts, but they did not find those laws contrary to their interests until after 1900, because of the trend of lower prices in general and because of the decreasing unit costs of operation.

In concluding our comment on rate and service regulation, we should not overlook the influence of the Massachusetts Board of Railroad Commissioners, who occasionally exerted definite influence without the use of statutes. Their technique and its effectiveness may be illustrated by the commissioners' attempt to reduce drastically coal rates in the early 'seventies for the purpose of stimulating manufacturing in Massachusetts. They conferred with the leading railroads, published the correspondence, and publicly advocated the cause, as well as championing the proposal to have the state purchase the Fitchburg Railroad and its connections via the Hoosac Tunnel. The result was that the Fitchburg moderately reduced its coal rates. A year or two later, incidentally, coal rates dropped even further because of another factor, the elimination

of middlemen who had been purchasing coal in Pennsylvania and shipping it by water to Boston, Salem, Newburyport, Portsmouth, and other ports for storage until sales could be arranged. Apparently the mine operators on their own initiative eliminated the middlemen by establishing large coal depots at the New England ports with the assistance of the railroads.

CONSTRUCTION OF THE NORTH STATION

The Massachusetts legislature also influenced management decisions in the construction of Boston's first union passenger station. There were several aspects to the terminal problems of the four roads entering North Boston: (1) The Fitchburg passenger tracks crossed the tracks of the other roads at grade in Somerville and Charlestown, just before crossing the Charles River to enter Boston, (2) the Boston & Maine passenger trains crossed busy Causeway Street at grade to reach the company's station at Haymarket Square, and, (3) after a few decades, some of the passenger depots had become inadequate for the expanding traffic.

The legislature first concerned itself with the danger that existed from the Fitchburg track crossing the tracks of the other three roads. E. S. Chesbrough, appointed by the legislature in 1849 to study the situation, recommended a "know-nothing-stop," that is, each train of the four roads would stop before crossing the track of another road. Although originally rejected by the legislature, this rule was enacted in a statute of 1855, at which time the legislature also required the elimination of one crossing. Also, in 1855, the legislature considered the problem created by the Boston & Maine passenger trains crossing Causeway Street, but took no action.

In 1869 and 1870, all aspects of the passenger terminal facilities of the four roads were discussed by the respective managements. The legislature opened the question by changing the legal requirements for width of the drawbridges; in fact, a series of enactments changed the requirements three times within thirteen months! About the same time a joint report of the Board of Harbor Commissioners and the newly established Board of Railroad Commissioners made three recommendations; (1) there should be considerable rearrangement of track with certain tracks to be elevated; (2) there should be one large bridge near the location of the present Charles River Dam to replace all railroad passenger pile and drawbridges across the Charles River; and (3) all passenger depots in North Boston should be relocated. Presumably, the entire cost would be borne by the railroads. A senate committee shelved the report; the proposed changes appeared to be too expensive.

In the early 'eighties, under President George C. Lord, the Boston & Maine management endorsed the idea of an elevated track across Causeway Street and into the second floor of their station and sought permissive legislation for a construction permit. The legislature asked the Board of Railroad Commissioners for a special report. After extended hearings, the commissioners approved the proposal along with

other recommendations involving the location of the station buildings and tracks of the other railroads.

During 1884-86, the Boston & Maine leased the Eastern and opened formal conversations with the Boston & Lowell concerning a lease of that road. These developments suggested the expediency of one union passenger depot to serve those roads and the Fitchburg Railroad, whose track, it will be remembered, crossed all of the other roads to reach its passenger station.

Consequently, the Boston & Maine again approached the legislature and this time obtained permissive legislation to build a union station between the Charles River and Causeway Street, thus eliminating the grade crossing at Causeway Street. Officials of the railroads discussed various ideas but no plans were adopted.

When the Boston & Maine leased the Boston & Lowell in 1887, the Massachusetts legislature, upon the joint petition of the two remaining railroads—the Boston & Maine and the Fitchburg—passed a mandatory act for the construction of a new station, requiring the Boston & Maine to furnish plans for the Fitchburg's acceptance or modification, with final plans to be approved by the Board of Railroad Commissioners. Unfortunately, the two roads could not agree upon either the arrangement of their tracks or the extent to which the station building would be truly a union depot. Suddenly, all discussion ceased because of the federal government.

The Secretary of War, under authority recently granted by Congress, notified the Boston & Maine and the Fitchburg on December 6, 1888, that all drawbridges over the Charles River had to be altered by January 1, 1891, so that navigation would be "free, easy and unobstructed." There were five railroad bridges on piles, occupying thirty acres of bed and channel of the river basin. They had been built by the four railroads without any systematic relation to each other. Expensive to maintain, difficult for navigation, and creating a nuisance and stench, the pile structures admittedly needed major revision or replacement, if the Charles River basin was to be enlarged for tide-water shipping. It so happened that the deepest part of Boston harbor was along the stretch encumbered by the railroad bridges. Richard Olney, Boston & Maine counsel and director, obtained the introduction of a bill in Congress during January, 1892, to exempt bridges already constructed. The effort failed.

Meanwhile, the Massachusetts Board of Railroad Commissioners retained Thomas Doane to recommend improvements for a passenger terminal. His report of January, 1892, proposed that a union station be built between Nashua and Leverett Streets, facing Causeway Street, and that the tracks be elevated before crossing the Charles River and enter the new station building on an upper level, in about the same location and elevation as the Rapid Transit System's elevated tracks later were built. The Board of Railroad Commissioners agreed with Doane's recommendations, and a year later suggested that since the cost would be some \$5,670,000, the Commonwealth and the towns of Boston, Charlestown, and Somerville should pay a large portion of the ex-

penditure. Apparently, no serious effort was made to follow that suggestion.

The Fitchburg management had become restless and was urging the Boston & Maine officials to proceed with plans. General Manager John W. Sanborn, of the Boston & Maine, had proposed a union station on the site where the present North Station is located, incorporating the Boston & Lowell station as one side of the new structure. Sanborn's proposal was adopted by the new president, Archibald McLeod, and the new board, but was not formally presented to the Fitchburg.

Meanwhile, the legislature assigned to the Board of Railroad Commissioners the task of ascertaining why no station was under way as required by the Statute of 1887. Very soon after the commissioners held their hearings in early 1893, the managements of the two railroads finally agreed upon the details, and construction on Boston's first union station was commenced. Although the legislators and the Board of Railroad Commissioners may have prodded the railroad managements, perhaps the chief reason for an agreement was the realization that a union station, a rearrangement of the adjacent yards, and the installation of modern signals and switches would be the only economical method of simplifying the track-crossing problem.

There remained the question of replacing the pile bridges across the Charles River, which the Secretary of War had finally ordered must be done within ten years. The Boston & Maine management had implied to the legislature, according to some journalists, that for this reason the railroad should be permitted to build a more or less temporary structure between the river and Causeway Street, rather than an expensive structure with elevated tracks.

Actually, the three-million-dollar structure was far from temporary. The impressive 568-foot front of the station featured a massive, central entrance of cut granite with a tinted glass arched roof. Behind the head house was a train shed covering twenty-three tracks with enough space to hold 184 cars. It was the largest station in North America and was used by the largest number of passengers, some 27 or 28 million annually arriving or departing on the 551 regular daily trains and a number of extra trains.

The final decision of the Boston & Maine management and the acquiescence of the Fitchburg to build the North Station as a "permanent" structure, with tracks crossing the Charles River at the old level, was more economical than it would have been to build a station with elevated tracks according to Doane's plan. Although national government officials had said the old bridges could remain only another ten years, the management of the Boston & Maine felt that all the government really wanted was iron or masonry bridges to replace the pile structures and that new bridges could be left at the same level. That decision meant that the Charles River could not be used for any significant amount of navigation, an item that greatly aggravated the editor of a local newspaper. Actually, most of the important navigation on the Charles already had ceased.

CONCLUSION

What then, may we conclude concerning the influence of government regulation on the management decisions of forty-five railroads in New England before 1900?

Decisions were influenced, but not to the extent necessary to classify them as a regulated industry, in the sense of the term as used today. There were regulations, it is true; many more, in fact, than the ones we mentioned. But the influence on management decisions was spotted and in no way acted as a basic guide or restriction upon the railroads. The managements frequently were sensitive to public opinion, but that is not a characteristic peculiar only to a regulated industry.

It would be appropriate, we contend, to attempt a statement concerning the steps that occurred in the nineteenth and early twentieth centuries toward today's regulated status of the railroad industry. If the type of evidence presented in this paper were obtained for other areas of the United States, our understanding of railroad history would be enlightened concerning the appraisal of railroad management, the reasons government regulation developed, and, especially the effectiveness of government effort to regulate competition and to increase safety and efficiency.

MAJOR RAILROADS THAT BECAME A PART OF THE BOSTON & MAINE SYSTEM

<i>Railroad</i>	<i>Chartered</i>	<i>Operated Separately</i>	<i>Operated Under Joint Management</i>
1 Boston & Lowell	1830	1835-57; 1878-31; 1883-87	1857-78 with N & L 1881-83 with Concord
2 Boston & Maine	1833 ¹	1836-	
3 Boston, Concord & Montreal	1844	1848-84	
4 Cheshire	1844; 1845	1847-90	
5 Concord	1835	1842-70; 1871-31; 1883-89	1881-83 with B & L
6 Connecticut River	1842 ²	1845-93 ²	
7 Connecticut & Passumpic Rivers	1835; 1845	1848-87	
8 Eastern	1836	1838-84	
9 Fitchburg	1842	1844-1900 ³	
10 Nashua & Lowell	1835	1838-57; 1878-80	1857-78 with B & L
11 Northern	1844	1847-84; ⁴ 1887-88	
12 Portland, Saco & Portsmouth	1837	1842-71	1847-71 operated separately, but under joint lease of B & M and Eastern
13 Troy & Boston	1849	1852-87	
14 Vermont & Mass.	1844	1849-74 ⁵	
15 Worcester & Nashua	1844 ⁶	1848-86 ⁷	

<i>Railroad</i>	<i>Separately Operated</i>	<i>Operated by Other Roads</i>
16 Ashburnham	1874-76, 1878-85	Fitchburg
17 Boston, Barre & Gardner	1871-85	Fitchburg
18 Boston, Hoosac Tunnel & Western	1879-87	Fitchburg
19 Charlestown Branch	1841-45	N & L; Fitchburg
20 Cochecho (Succeeded by Dover & Winnipiseogee)	1849-63	B & M
21 Concord & Claremont (succeeded by Merrimack & Connecticut River)	1849-54 1856-58	Northern
22 Contoocook Valley (succeeded by Contoocook River)	1852-58	Concord & Claremont
23 Essex	1849-51	Concord; Northern
24 Great Falls & Conway (succeeded by Portsmouth, Great Falls & Conway)	1851-65	Eastern
25 Lexington & West Cambridge (succeeded by Lexington & Arlington)	1857-70	Fitchburg; B&L
26 Lowell & Lawrence	1848-58	B&L
27 Manchester & Keene	1878-79	N&L; Ct. River; B&L
28 Manchester & Lawrence	1849-50, 1853-56	Concord; B&M
29 Massachusetts Central	1880-83	B&L
30 Monadnock	1870-74	Boston, Barre & Gardner; Chesire; Fitchburg
31 Mt. Washington	1872-94	Concord & Montreal
32 Nashua, Acton & Boston	1873-76	Concord
33 New Hampshire Central (succeeded by Merrimack & Connecticut River)	1850-54	Northern; Concord; Concord & Montreal
34 Newburyport	1850-60	B & M
35 Orchard Beach	1880-83	B & M
36 Peterborough & Shirley	1850-56	Fitchburg
37 Portsmouth & Concord (succeeded by Concord & Portsmouth)	1849-58	Concord
38 Profile & Franconia Notch	1879-91	Concord & Montreal
39 Saugus Branch	1853	Eastern
40 South Reading Branch	1850-51	Eastern
41 Sullivan	1849-63	Vt. Cen.; Cen. Vt.; Ct. River
42 Vermont Valley (succeeded by Vt. Valley R. R. Company of 1871)	1851-65, 1877-80	J. B. Page & E. A. Burchard; Rutland; Ct. River
43 White Mountains	1854-59	B C & M
44 Whitefield & Jefferson	1879-90	Concord & Montreal
45 York & Cumberland (succeeded by Portland & Rochester)	1851-1900	B & M

¹ Includes Andover & Wilmington and other predecessor companies.

² Includes Northampton & Springfield, a predecessor company.

³ Operated by Charlestown Branch R. R. Co., 1843-44. The Charlestown Branch was purchased by the Fitchburg in 1846.

⁴ Operated by Concord, 1846-47.

⁵ Operated by Fitchburg, 1847-49.

⁶ Date includes Groton & Nashua, a predecessor company.

⁷ Includes Worcester, Nashua & Rochester R. R. Company, successor company.

The Development of the Railroads in Washington

BY CHARLES THOMAS

During the early nineteenth century, the District of Columbia's transportation links consisted primarily of turnpikes and the Potomac River. Trips were necessarily slow, the trip from Baltimore to Washington by stage coach taking eleven hours and the Richmond - Washington run taking thirty-eight hours. Alexandria was an important east coast seaport and was a fierce rival with Baltimore for the traffic of the Shenandoah Valley and the traffic to the South and to the West.

A small voice was beginning to be heard in transportation circles, a voice which spoke of a new, efficient, speedy form of transportation—one which rode on rails. Evidently Baltimore's ears were more sensitive than Alexandria's for in 1827 her merchants chartered the Baltimore and Ohio Railroad Company in the State of Maryland. It was not yet apparent that Baltimore had gained an advantage which was to doom Alexandria as a seaport power.

The B&O laid its first "stone" on July 4, 1828, reaching Frederick on December 1, 1831, and Cumberland in 1842. From Cumberland it continued westward along the Ohio River. The farmers of the upper Shenandoah Valley, who had always sent their produce to market through Alexandria, foresaw the potential of this new railway, and commenced to build their own railroad, the Winchester and Potomac. This line, chartered in 1832 to run from Winchester to a connection with the B&O at Harpers Ferry, was duly effected in 1836, and the wagon trade to Alexandria came to an end.

Perhaps because of the discomforts suffered by Congressmen during the stage ride between Baltimore and Washington, pressure was brought to bear upon the B&O to extend a branch from Baltimore to the nation's capital. The earliest known legislation towards this end was signed by President John Quincy Adams on May 9, 1828, allowing the authorization of, "a railroad within the District of Columbia."

The first answer to this pressure was given on January 22, 1831, when Jonathan Knight, the chief engineer of the B&O, reported that he had made a, "Reconnaissance of the ground between Baltimore and Washington . . ." His report considered, "a speed of about 20 miles per hour so that the trip could be made within two hours; a locomotive engine weighing six tons to convey a train of six cars, containing one hundred passengers . . ." On October 1, 1834, it was reported that, "... the graduation of the Washington Rail Road is completed as far as the District Line, with the exception of the deep cuts. These, it is confidently expected, will also be finished by the first day of January next."

The first train was welcomed with appropriate ceremony into Washington on August 25, 1835. At this time the railroad took two and

one-half hours to make the Baltimore - Washington run, in comparison with the eleven hour stage run. The B&O's station was located in a converted lodging house at the northwest corner of Second Street and Pennsylvania Avenue. A bell installed in the station was rung twice, twenty minutes before the departure of a train, and five minutes before its departure, to warn the townspeople of its leaving. The station was abandoned in 1852, when the B&O put up a new structure at New Jersey Avenue and C Street. It was reported as having, "a beautiful front, built of Connecticut brown stone, and surmounted with a fine quadrangular tower, 70 feet high and 18 feet square, whose sides exhibit the faces of a large well-regulated time keeper. In the night the building is handsomely lighted with gas."

Meanwhile, the merchants of Alexandria had become increasingly concerned over the menace of Baltimore. In an attempt to divert the traffic then flowing to the B&O from the Winchester and Potomac at Harpers Ferry, they chartered the "Alexandria and Harpers Ferry Railroad Company" on March 20, 1847. This railroad would have run between its namesake towns, intercepting the valley traffic at Harpers Ferry. The management of the B&O learned of the Alexandrians' efforts, and in a move which crushed Alexandria's hopes, acquired control of the voting stock of the Winchester and Potomac, thus preventing the proposed consolidation with the Alexandria and Harpers Ferry line.

Prior to 1815, the only public passenger transportation between Washington and Richmond had been limited to stage coach travel, taking thirty-eight hours. This time was shortened to twenty-three hours in 1815 with the elimination of the Washington-Aquia Creek stage run and the substitution of a steamboat in its place. At this time a passenger left Washington in the evening, spending the night on the comfortable steamboat, transferring to stage coach at Aquia Creek for the ride to Richmond.

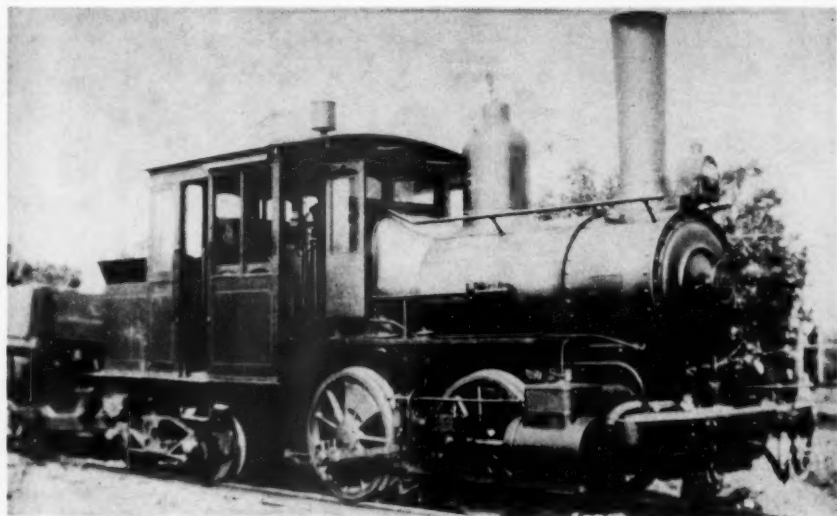
In 1834, the Virginia General Assembly passed a charter for the construction of the Richmond, Fredericksburg, and Potomac Railroad. This line would replace the Richmond-Fredericksburg-Aquia Creek stage run, connecting with the steamboat at Aquia Creek for the exchange of passengers and freight to Washington. The first twenty miles of this line were opened on February 13, 1836, when an "amazing" speed of ten miles per hour was attained by the first train. In 1842 the line was completed to Aquia Creek.

In 1848 Alexandria, now more worried than ever about its losing race against Baltimore, was asked if it would be interested in helping a group of southside neighbors in building a railroad from Gordonsville, through Orange, to Alexandria. This railroad, the Orange and Alexandria Railroad, had been chartered on March 27, 1848, but its founders were unable to finance it. Alexandria, however, had the necessary capital, and was more than interested in helping to finance it. Backed by \$100,000 worth of stock, subscribed to by the Alexandria City Council, construction on the Orange and Alexandria began early in 1850. After leaving Alexandria, construction reached Manassas, then known as "Tudor Hall," in October, 1851. The line was opened



Photo by Raymond Hicks, Courtesy: Lee H. Rogers.

East Washington #12 (the former Chesapeake Beach #12) poses at the B&O Connection on November 22, 1941.



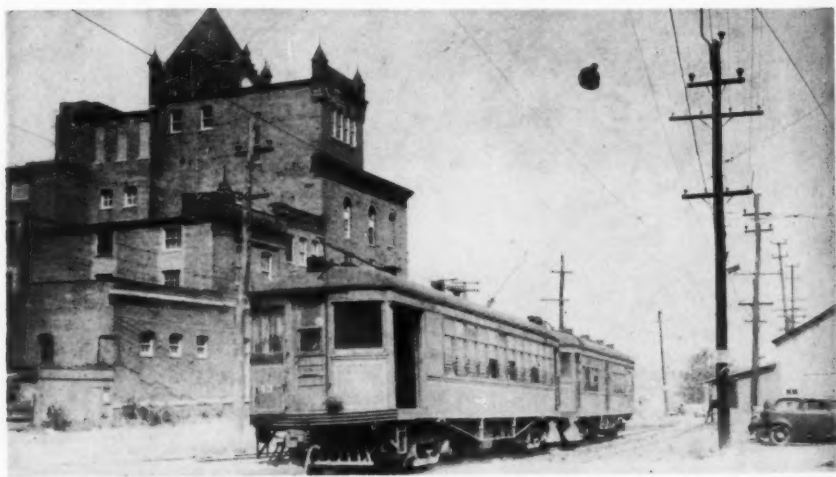
Courtesy: Rice's Railroadographs.

A rare picture of W&OD #169, an ex-New York Elevated Forney type locomotive. On the W&OD about 1912.



Courtesy: Lee H. Rogers.

Pleasure seekers alight from their coaches at Chesapeake Beach in this rare, pre-World War I photograph by Harris & Ewing.



Courtesy: Rice's Railroadographs.

The 1:15 PM PURCELLVILLE EXPRESS highballs out of the W&OD Rosslyn Station on October 20, 1940.
Cars are #43-44.



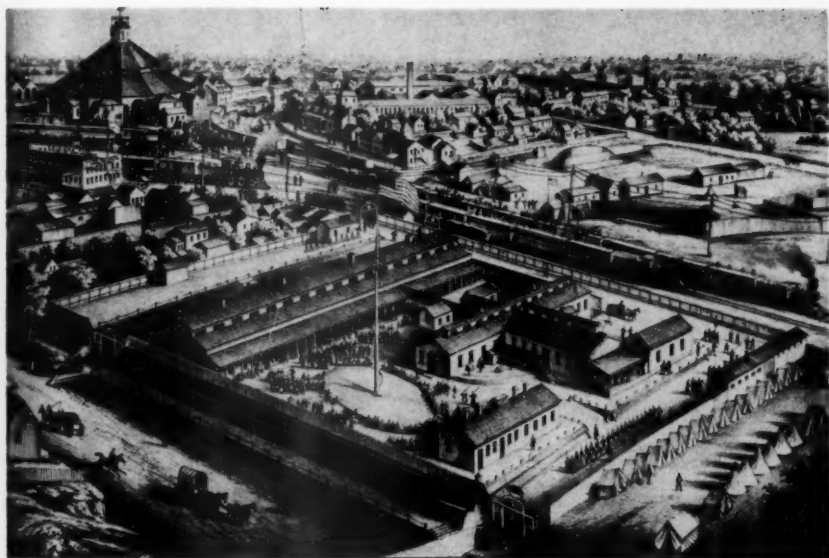
Courtesy of Baltimore & Ohio Railroad Company.
FIRST WASHINGTON, D. C., DEPOT—1835.



Courtesy of Baltimore & Ohio Railroad Company.

BALTIMORE & OHIO PASSENGER STATION, WASHINGTON, D. C.

Built in 1852 this station was located at the corner of New Jersey Avenue and C Street.

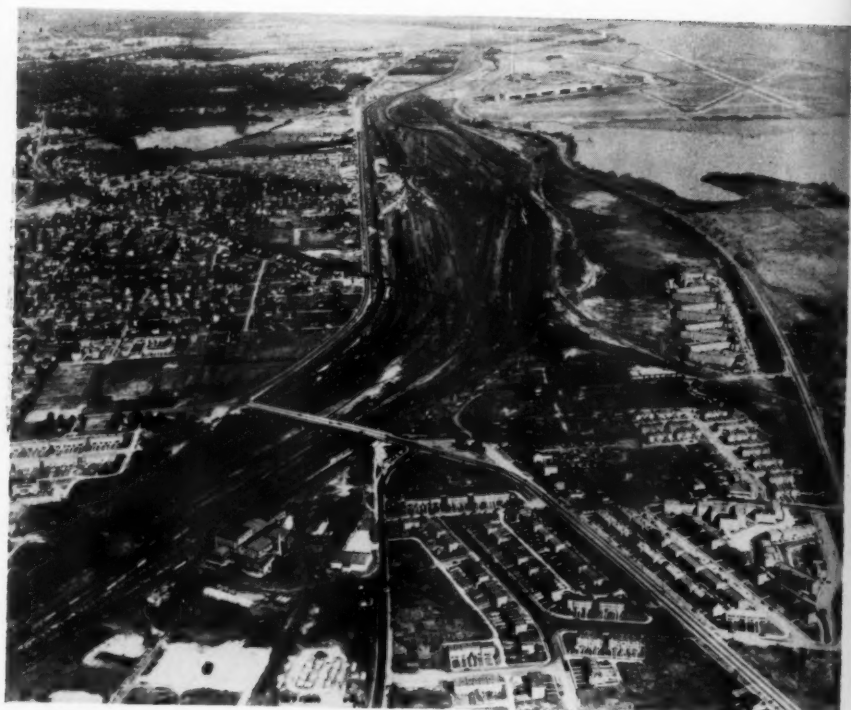


SOLDIERS REST, ALEXANDRIA, VA.

Courtesy of Southern Railway Co.

"Soldiers Rest, Alexandria, Va."

Copied from a lithograph made by Chas. Magnus, 12 Frankfort Street, New York, N. Y.
and 520 Seventh Street, Washington, D. C.



Courtesy of R. F. & P. R. R.

POTOMAC YARD—ALEXANDRIA, VIRGINIA



UNION STATION, WASHINGTON, D. C.

The station was first opened to the public on October 27, 1907. It occupies 231,097 square feet of floor space

Courtesy of Association of American Railroads.

INLAND ROUTE



FOR NORTHERN AND SOUTHERN TRAVELLING.

The RICHMOND, FREDERICKSBURG AND POTOMAC RAIL ROAD COMPANY, in connection with the other Rail Road and Steamboat Companies on the route, have adopted the following Schedule, by which the daily Mail is now carried.

LEGONS (NORTHWARD DIRECTION.)				Arrive at			
Blakely, N. C.	.....	at	5 o'clock, P. M.	Petersburg,	at	10 o'clock, P. M.	
Petersburg,	" 12 "	A. M.		Richmond,	" 4 "	A. M.	
Richmond,	" 41 "	A. M.		Washington,	" 6 "	P. M.	
Washington,	" 71 "	P. M.		Baltimore,	" 10 "	P. M.	
Baltimore,	" 6 "	A. M.		New York,	" 11 "	P. M.	

LEGONS (SOUTHWARD DIRECTION.)				Arrive at			
New York, .....	.....	at	4 o'clock, P. M.	Baltimore,	at	3 o'clock, P. M.	
Baltimore,	" 5 "	P. M.		Washington,	" 8 "	P. M.	
Washington,	" 10 "	P. M.		Richmond,	" 2 "	P. M.	
Richmond,	" 3 "	P. M.		Petersburg,	" 7 "	P. M.	
Petersburg,	" 11 "	A. M.		Blakely,	" 7 "	A. M.	

The whole time required between *Blakely* and *New York*, being Northwards, 54 hours; Southwards, 57 hours. Between *New Orleans* and *New York*, Northwards, 12 days and 13 hours; Southwards, 13 days and 8 hours. Of the whole distance between *Blakely* and *Baltimore*, 126 miles is travelled upon Rail Roads, and 50 miles by Steamboat.

The Stage Travelling, which is conducted by Messrs. J. WOOLFOLK & Co. and Messrs. J. H. AVERY & Co. in the handsomest manner, being now only 67 miles, is becoming rapidly reduced by the extension of this Rail Road.

Passengers are never in danger of delay, preference being given to such as enter and continue on the line.

By arrangements which this Company is making, Passengers, with their baggage, will be conveyed to and from the Depot, without charge. On the Rail Road, a coach will be especially appropriated to Northern and Southern Travellers; and in general, the Company's Agents will adopt all measures calculated to expedite and facilitate their journey.

Carriages and Horses are safely and expeditiously transported; enabling those travelling in them, with the additional use of the Potomac Steamboat, and the Petersburg Rail Road, to accomplish, without fatigue to their horses, the journey between Washington and Blakely, N. C. in two days.

The Mail Train leaves Richmond at 4 1/2 o'clock, A. M.; returning, leaves the North Anna at 12 o'clock, M. The alternate Trains for Passengers and Freight, leave the North Anna at 7 o'clock, A. M. and 4, P. M.; and Richmond at 9 o'clock, A. M. and 1, P. M.

All possible care will be taken of baggage, but it will be carried only at its owner's risk.

Rail Road Office, Richmond, May 30, 1836.

Courtesy of Association of American Railroads.

Timetable of the Richmond, Fredericksburg and Potomac Rail Road Company, dated May 30, 1836. At that time the road was operating between Richmond and the North Anna River, a distance of about 25 miles.

from Alexandria to Gordonsville in 1854, "with much ceremony, and a public parade in the City of Alexandria."

Since Alexandria had already lost its trade with the upper Shenandoah Valley, it was determined not to lose its contacts with the fertile middle Valley of Virginia. Bolstered by its success with the Orange and Alexandria, Alexandria proposed a charter, "for the purpose of making a railroad from some convenient point on the Orange and Alexandria Railroad, through Manassas Gap, passing near the town of Strasburg, to the town of Harrisonburg, in the county of Rockingham." This charter was approved by the General Assembly on March 9, 1850, but no state aid was promised.

Alexandria lost interest at this point, but some Fauquier County men foresaw the potential of this line, and pitched in with all their might to bring it into being. A contemporary historian stated that, "These men had seen turnpikes built to the north and south of them . . . and were now stimulated to action by what seemed to be a promise of commercial isolation . . ." He continues by reporting that, "It was due to the energy and courage of Edward C. Marshall, James W. Foster, Alfred Rector and Thomas H. Boswell, all of Fauquier, that the Manassas Gap Railroad was achieved."

Edward Marshall, the son of Chief Justice John Marshall, was elected president of the Manassas Gap. Under his direction it expanded from Manassas Junction through Gainesville and Front Royal, reaching Strasburg on October 19, 1854. This triumphant occasion caused President Marshall to report, "the iron horse of Manassas this day takes his first draught of limestone water." After four years of hard work a group of farmers had built sixty-one miles of railroad and become the first Virginians to lay rail across the Blue Ridge. The Manassas Gap continued to expand southward down the Valley toward Harrisonburg, reaching Mt. Jackson in 1859.

Back in Alexandria, new hope had been stirred with the prospect of a railroad to connect Alexandria with the rich coal fields of Hampshire County, Virginia, now West Virginia. This line was nothing more than an extension of the aforementioned Alexandria and Harpers Ferry Railroad. It was, however, far more foresighted than the earlier proposal, and would open up new fields of commerce for Alexandria. Sufficient interest was aroused in Alexandria towards this new venture, and actual construction of the "Alexandria, Loudoun and Hampshire Railroad" began in February of 1855, reaching Leesburg in the summer of 1858. Much of the companies' resources were used in surveys west of the Blue Ridge, and little work was done on the roadbed west of Leesburg.

The Alexandria and Washington Railroad began operations between the south end of the Long Bridge, now the 14th street bridge, and Alexandria in 1858. Oddly enough, except for the Civil War period when rails were run across the bridge, this line ended in Virginia, with the passengers transferring to stage coach to cross the river into Washington. Alexandria passenger depots were maintained on Fayette

Street by the Alexandria and Washington Railroad, and on Henry Street, one block away, by the Orange and Alexandria Railroad.

During the Civil War, Washington's railroads occupied a rather precarious position. The B&O had been active in the war from the start and had carried troops to fight John Brown, in the infamous "John Brown's Raid" at Harpers Ferry in 1859. Strangely enough, the B&O had thought that it would be a southern railroad, as its management believed that Maryland would secede with Virginia, thus placing the B&O within Southern boundaries. Maryland, however, did not secede from the Union, and the B&O did a quick about face in its thinking. The B&O did its part well in serving the Union. Suffering numerous guerrilla and army attacks, it continually bounced back, serving the Union cause to the best of its capabilities.

During the early years of the war, the Manassas Gap played an important part in Southern strategy. It became the first American railroad to carry troops into battle. This service was rendered in July of 1861 during the movement of Confederate troops to the Battle of First Manassas. The Manassas Gap line was also used in the transporting of locomotives stolen from the B&O by Thomas Jonathan Jackson at Harpers Ferry. These engines had been carried from Harpers Ferry to Winchester over the Winchester and Potomac, but had to be horsecarted from Winchester to Strasburg, where they were placed on the Manassas Gap's rail. The Manassas Gap discontinued operation in March, 1862, when General Johnston abandoned his line in front of Washington.

The coming of the Civil War brought to a halt the progress of the Alexandria, Loudoun and Hampshire. Operation was suspended when Lee's retreating troops burned the trestles and destroyed much of the roadbed.

The Orange and Alexandria and the Richmond, Fredericksburg and Potomac were both "railroads divided" during the Civil War. They both were operated throughout the war, but often one end of the line was operated by the Union while the other was operated by the Confederacy. Both were run with a mind to the present, and little care was given to their future operation.

The end of hostilities left all of these lines in sad physical and financial shape. On the B&O it was mostly a clean-up, fix-up campaign, but on the southern roads often more drastic steps were necessary. The R. F. & P. had to "start from scratch." Its treasury held only Confederate money, and its roadbed was either destroyed or in a greatly deteriorated condition. Reconstruction was accomplished by the R. F. & P. without having to change its identity, but it was a difficult process.

The Manassas Gap's owners valiantly tried to reopen the line, but to no avail. They needed capital which they didn't have. Fortunately, at this time a proposal was made whereby the Manassas Gap and the Orange and Alexandria would consolidate their resources into one united company. This proposal was agreeable to both companies, and on February 14, 1867, the two lines emerged as the Orange, Alexandria and Manassas Railroad. Reconstruction of the Harrisonburg (Manassas

Gap) Branch began again, and trains were running to Mt. Jackson by August, 1868. Construction of the Mt. Jackson-Harrisonburg line was continued, and the trains began running into Harrisonburg on January 15, 1869.

The stock of the Alexandria, Loudoun and Hampshire was liquidated on April 17, 1867, and a new company, the Washington and Ohio Railroad company, was formed on March 29, 1870. This company followed the basic plans of the Hampshire Railroad, but was to be extended to the Ohio River to compete with the B&O railroad and the Chesapeake and Ohio Canal. In 1874, the line was extended to Roundhill, Virginia, a distance of thirteen miles from Leesburg. Here the terminus remained until the 1900's.

In 1861 the Pennsylvania Railroad, a Philadelphia backed company, had bought control of the Northern Central Railroad, which connected Baltimore, Maryland, and Harrisburg, Pennsylvania. The Pennsylvania had established itself as a competitor of the B&O, and was interested in continuing into the nation's capital from Baltimore, a route which the B&O had monopolized since 1835. The Maryland legislature, a group favoring the home-grown Baltimore and Ohio, was unwilling to let the Pennsy run a line between Baltimore and Washington, and there the matter might have lain, if it had not been for the activities of a group of southern Maryland plantation owners in the year 1853. These gentlemen had obtained a charter from the legislature on May 6, 1853, allowing them to build a railroad from Baltimore to Pope's Creek. Because of lack of support, this line had not been built, and the charter lay dormant. An interesting provision of the charter provided that the Baltimore and Potomac Railroad, as the line was called, might build "lateral branches," not to exceed twenty miles in length, from the main line. The Pennsylvania became aware of this provision in the charter just after the close of the Civil War, and after investigation found that it was possible, by locating the main line to Pope's Creek through Bowie, to extend a branch line just short of twenty miles in length to the District of Columbia. Needless to say, the Pennsylvania was quick to take advantage of this charter, and in August, 1866, Pennsy forces gained control of the Baltimore and Potomac. By the end of 1868, thirty-five miles of the main line had been graded, and in 1869, the line to Washington was graded. The line from Baltimore to Washington was opened on July 2, 1872, and the Baltimore-Pope's Creek line was opened in September of 1873. Congress had, by an act approved June 21, 1870, authorized the Baltimore and Potomac to extend its line by way of Maryland Avenue, in the District, to the Long Bridge crossing the Potomac, and there to join with the Alexandria and Washington Railroad. The Baltimore and Potomac was granted "perpetual use" of the bridge, provided that the railroad should maintain it for regular traffic and permit other railroads to use it. This arrangement is still in use.

The Baltimore and Ohio had also been busy in extending its branch lines. When it learned of the continuation of the Harrisonburg Branch down of the Valley of Virginia, it decided to pursue its dream of build-

ing a branch down the Valley to Roanoke. Under the auspices of the B&O, the Winchester and Strasburg Railroad began construction from Winchester to Strasburg in 1867. This line was completed in 1870, providing a through line from Harpers Ferry to Strasburg. The B&O gained control of the Orange, Alexandria, and Manassas Railroad in 1872. Under B&O control the name of the Orange, Alexandria and Manassas was changed to the "Washington City, Virginia Midland, and Great Southern Railroad Company." The B&O was quick to exercise its control of this company by leasing the Harrisonburg Branch from Strasburg to Harrisonburg. From Harrisonburg, the B&O built southward, toward Roanoke, ending up in Lexington.

During the 1860's Mayor Wallach, of Washington, had suggested that the B&O build a line from Washington to Point of Rocks, thus shortening the present run by fifty-four miles. At this time it was necessary to backtrack up the Washington Branch to Relay, Maryland, where the "old main line" branched off to continue westward to Frederick and Point of Rocks. The new line from Washington through Silver Spring and Rockville to Point of Rocks was opened on May 25, 1873.

The Alexandria and Fredericksburg Railroad, a proposed link between the Richmond, Fredericksburg and Potomac at Aquia Creek, and the Alexandria and Washington at Alexandria, had been chartered in 1851. This line had received much consideration by the R. F. & P., but no construction had been done on it. The Pennsylvania Railroad, however, had been casting long glances toward the south. And with the completion of the Baltimore and Potomac it was ready to expand in that direction. It acquired control of both the Alexandria and Washington and the Alexandria and Fredericksburg. Construction of the Fredericksburg line was begun towards a connection with the R. F. & P. at Quantico, Virginia. On October 11, 1870, the stockholders of the R. F. & P. held a special meeting to consider the expansion of the line northward. At this meeting they authorized construction of a ten mile extension from Brooke Station. The ten miles granted in the charter did not, however, include an extra one and a half mile extension necessary to meet the contemplated connection point with the Alexandria and Fredericksburg at Quantico Creek. This problem was surmounted with the incorporation of the "Potomac Railroad Company," which connected the R. F. & P. extension with Quantico Creek. The new line from Brooke Station to Quantico Creek was opened on May 1, 1872, and the old steamboat service was moved from Aquia Creek to Quantico Creek.

The Alexandria and Fredericksburg connected with the R. F. & P. on July 2, 1872, and through sleeper service was commenced between Weldon, North Carolina and Baltimore, Maryland, using the new line, on July 18.

The Alexandria and Fredericksburg and the R. F. & P. operated as separate companies, with the expenses of through train service being assumed by each on the basis of mileage. Washington-Quantico steamboat service was terminated on March 31, 1877, as the public preferred

the quicker and more convenient all-rail route. Later, in 1890, the Alexandria and Washington Railroad and the Alexandria and Fredericksburg were merged into the "Washington Southern Railroad," still under Pennsylvania Railroad control.

In 1877, the Washington and Ohio Railroad experienced various economic difficulties and precipitated a litigation which lasted for six years. Various attempts at reorganization were tried, but none succeeded in solving the financial problems. Finally, in 1883, the Washington, Ohio and Western Railroad was formed. This line was leased by the Richmond and Danville Railroad in 1886.

As the Norfolk and Western Railroad ran but a few miles from the Washington, Ohio and Western's terminus, at Roundhill, an extension was planned to join the W. O. & W. with the N. & W. at Berryville, thus giving the N. & W. an entrance to the City of Washington. This scheme did not materialize.

In the summer of 1900, an extension of about four miles was added to reach a summer resort in Bluemont, Virginia. This was as far as the railroad ever got, fifty-two miles from Washington.

On February 1, 1881, the Washington City, Virginia Midland and Great Southern Railroad Company changed names to become the Virginia Midland Railway, which was operated by the Richmond and Danville Railroad. In 1894 the Richmond and Danville Railroad and the East Tennessee, Virginia and Georgia Railroad joined together to form the present Southern Railway Company. This company was legally consolidated on June 21, 1898.

The B&O had been operating the Harrisonburg Branch from Strasburg to Harrisonburg since 1873 as a part of its own Valley Branch. During this period the B&O had been operating two through passenger trains a day between Baltimore, Harpers Ferry, Harrisonburg, and Lexington. This service ended when the B&O defaulted in its rental payment to the Southern Railway on March 1, 1896. The B&O still operated its lines from Harpers Ferry to Strasburg and from Harrisonburg to Lexington. In cooperation with the Southern, trains were still run from Baltimore to Lexington, but Southern Railway locomotives were used on the Strasburg-Harrisonburg stretch. The Southern began operation of Washington-Harrisonburg trains, which usually consisted of a mail-baggage car, an express car, a combine-smoker car, a coach and a Pullman parlor car. Passenger service on the Harrisonburg Branch gradually dwindled but service was maintained, except for a brief discontinuance during World War II, until January 5, 1948, when passenger service was discontinued. The B&O branch from Harrisonburg to Lexington had long since been abandoned, with the Shenandoah sub-division (Harpers Ferry to Strasburg) being used for "freight only."

A major problem of railroads in Washington during the early twentieth century concerned public grade crossings. In 1900, of twenty-eight grade crossings used by the B&O railroad, only one was carried over a public road by bridge. In south Washington the warning was, "Watch out! The Mall is full of railroad tracks!" This situation was

finally solved by the relocating of rail lines during the revival of the "L'Enfant plan" for the development of Washington. Under this plan, the present Union Station was built, and two tunnels were built to move the rails off the street.

The first train was operated into the Union Station by the B&O Railroad on October 27, 1907. The Pennsylvania abandoned its terminal, which was also used by the Chesapeake and Ohio Railway, which had acquired trackage rights over the Southern Railway into Washington, the Southern, the Richmond, Fredericksburg and Potomac, the Atlantic Coast Line and the Seaboard Air Line Railroad (both using RF&P trackage rights), on November 17, 1907. An *Evening Star* reporter recorded the close of business at the old Pennsy Passenger Terminal by saying, "With the close of business this morning the last locomotive whistle sounded and bell clanged in the old Pennsylvania Railroad Station at Sixth and B Streets N. W. Trains on all lines which found their Washington terminus in the smoke begrimed building at Sixth street, beginning with the first scheduled to arrive and depart this morning, rolled into or away from the old Capital City on the newly laid tracks into the Union Station."

Other changes were being felt on the Virginia side of the river. On November 1, 1901, the operation of the Washington Southern was turned over to the R. F. & P. Railroad. These two lines were operated as one company, but legally remained separate. After the consolidation of these two railroads plans were made for the construction of a new passenger station to be used jointly by all of the railroads running into Alexandria, but to be owned by the R. F. & P. This station, the present Alexandria Union Station, was completed on September 15, 1905. Washington was becoming a north-south gateway for freight traffic. As the existing facilities were not nearly large enough to adequately handle the increasing flow of traffic through Washington, a plan was made for the construction of the Potomac Rail Yards, in Alexandria, Virginia. This yard was to be operated for the mutual benefit of the Chesapeake and Ohio Railway, the Southern, the Pennsy, the Baltimore and Ohio, and the Richmond, Fredericksburg and Potomac until the year 2001. It was to be under R. F. & P. management. The new yard was opened on August 1, 1906, and since that time has become one of the most modern and efficient rail classification yards in America. On January 20, 1955, it became the first rail yard in the United States to use television as an aid in classifying freight cars. Because of its trunk line status, the R. F. & P. was of prime interest to all railroads handling north-south traffic through the Washington-Richmond gateway. Thus, in 1901 the Richmond-Washington Company, a holding company for the RF&P, was brought into being. The B&O, Pennsylvania, Southern, Atlantic Coast Line, Chesapeake and Ohio, and the Seaboard Air Line Railroad all bought equal shares in this company, under the provision that "the traffic of the six railroads parties to the agreement was to be handled . . . with equal promptness and upon equal terms." Under the guidance of the Richmond-Washington Company, the R. F. & P. and the Washington Southern were legally consolidated on February 24, 1920.

In the early twentieth century, branch and short line railroads began to appear all over the country. Washington was not to escape this phase of railroading.

Washingtonians had long used the Chesapeake Bay as a recreation center during the hot summer months, and the Washington and Chesapeake Beach Railway Company was chartered on September 1, 1891, in an attempt to capitalize on this activity. No work was done on this line, but on March 7, 1896, Otto Mears, of Colorado fame, chartered the Chesapeake Beach Railway, following the basic plan of the Washington and Chesapeake Beach. This line would run to Washington from a proposed "American Monte Carlo" on the shores of the Chesapeake Bay at Chesapeake Beach, Maryland. The Maryland authorities didn't see eye to eye with Mr. Mears on the gambling casino and vetoed this plan, but Mears continued construction of the railroad just the same. This line ran from a connection on the B&O near Seat Pleasant, Maryland, through Marlboro, to Chesapeake Beach. It depended primarily upon summer tourist traffic and, like so many other short lines, fell prey to automotive and bus competition. From 1921 on it began to carry fewer and fewer passengers and finally, in 1935, the line from Seat Pleasant to Chesapeake Beach was abandoned. The Seat Pleasant-B&O connection was retained as the present East Washington Railway, a freight-only short line.

If you had lived in Washington in the early 1900's you would, no doubt, have taken the Great Falls and Old Dominion Electric Railroad to Great Falls Park, the "Niagara of the South." People came to the park to watch the falls, to fish, and to hear the band concerts in the evenings. The falls, thirteen miles from Washington, were served by a two-track electric mainline featuring the, "finest cars and equipment in the United States."

The Great Falls and Old Dominion Electric Railroad was founded in 1900 by Senator Stephen B. Elkins and John R. McLean. The line was dependent on passenger traffic for 99% of its income, which was only \$465 for the years 1932 and 1933. The quick growth of the automobile as a competitor caused the abandonment of most of its trackage in 1934. The right-of-way used by the Great Falls and Old Dominion is now a main thoroughfare named Old Dominion Drive.

Before the abandonment of the Great Falls and Old Dominion, the line had leased the Bluemont branch from the Southern Railway, in 1912. The Bluemont line was the former Washington, Ohio and Western, which had been leased by the Richmond and Danville Railroad, a parent corporation of the Southern. A connecting line was built between the Great Falls line and the Bluemont line, from Thrifton, on the Great Falls and Old Dominion, to Bluemont on the old route. In 1912 these two lines became the Washington and Old Dominion Railway, going into receivership in 1932. In 1936 this line emerged as the present Washington and Old Dominion Railroad. The line was operated under lease from the Southern until 1943, when the Washington and Old Dominion purchased the line from Alexandria to Purcellville, the section from Purcellville west to Bluemont having been abandoned by the Southern Railway in

1939. Passenger service on the line was abandoned on May 31, 1951. On November 6, 1956, the Chesapeake and Ohio acquired the Washington and Old Dominion. Although the C&O owns the line, it is still operated as a separate company.

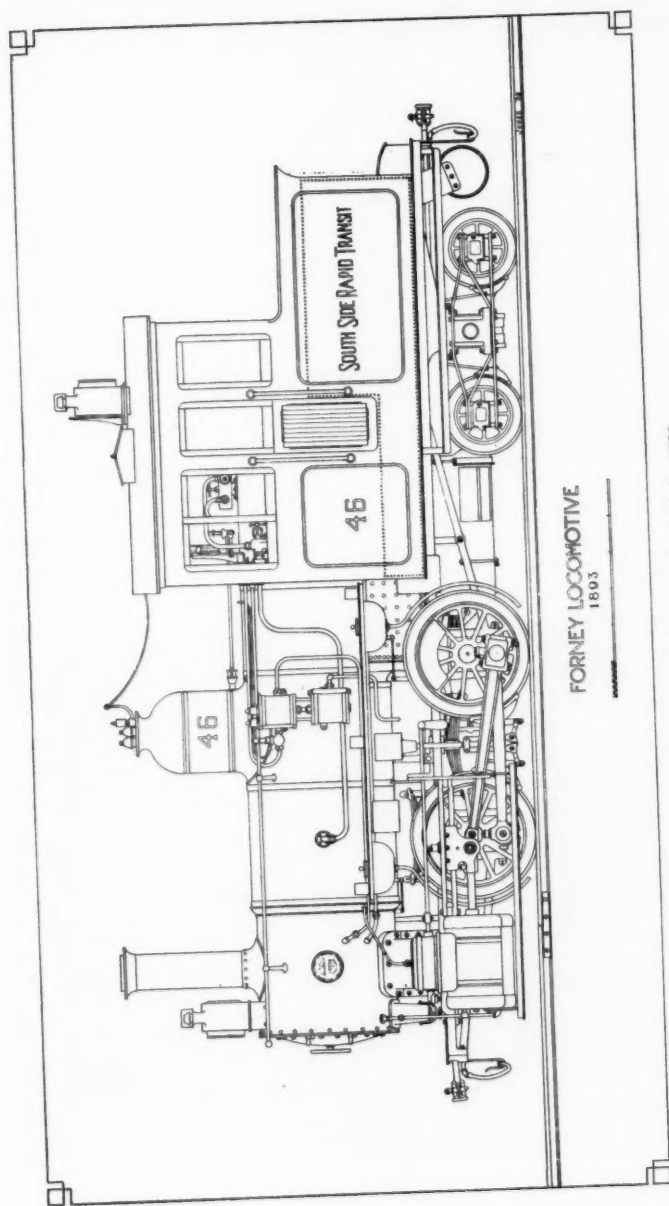
Georgetown, in the District of Columbia, had been developing as an industrial center. In an effort to tap this potential source of business, the Baltimore and Ohio built a branch from Georgetown Junction, a junction on the main line one mile west of Silver Spring station, through Chevy Chase and Bethesda, Maryland, to Georgetown, D. C. The portion of the line between Georgetown Junction and Chevy Chase was completed in 1892, the Chevy Chase-Georgetown portion being completed in 1909. This branch has been in a large part responsible for the rapid industrial development of the north western part of Washington and the territory lying across the river in Virginia.

In the last thirty years, few changes have been made on the routing of Washington's rail lines. Washington has now one of the most modern rail plants in the world. Its Union Station is one of the most beautiful rail terminals in America, and provides a convenient, centralized rail depot close to the Capitol. On February 10, 1935, the Pennsylvania inaugurated through Washington-New York electrified service. With this electrification, fast, three hour thirty-five minute passenger service between these cities is available. Schedule changes may shorten this to a three hour two minute schedule.

Dieselization was eminent from the start of World War II. After living with diesels in Washington for sixteen years, steam power said its final good-bye to Washington on November 2, 1953. Appropriately enough it was the B&O that kept steam in the nation's capital the longest, running its last steam powered passenger train out of Union Station one hundred and eighteen years after the entrance of the first steam powered train into the capital. As Stationmaster Paul E. Dowell said to a *Washington Post* reporter, "We got to love the steam engines. Maybe in a hundred years or so, we'll feel the same way about Diesels."

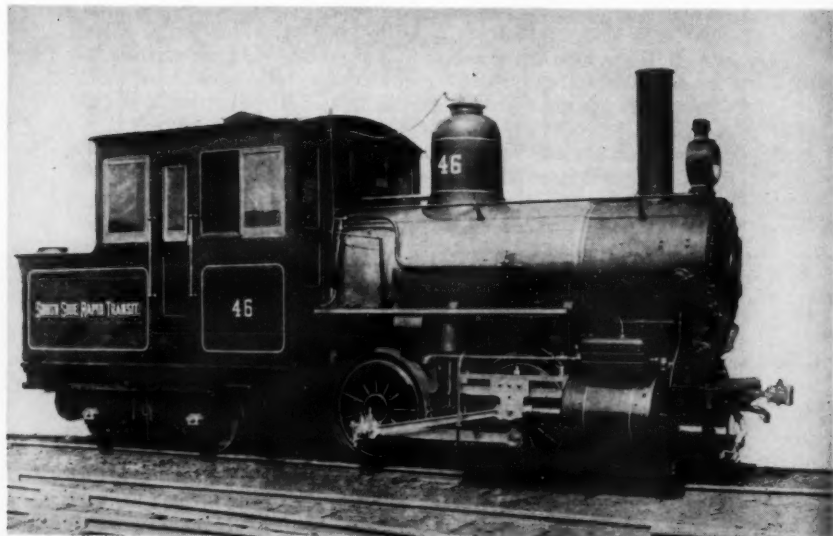
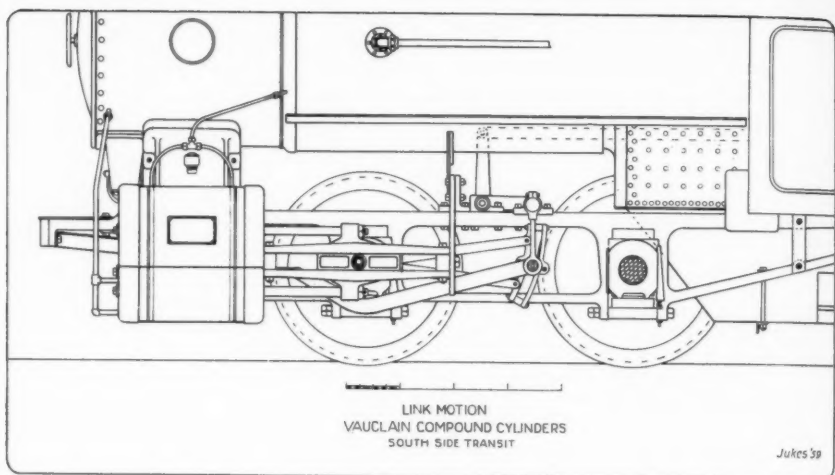
Progress in technology on Washington's railroads has been at work since the operation of the first train in 1835 to the first American railroad use of closed-circuit television in Potomac Yard in 1955. Washington's rail lines are service organizations, serving the needs of the nation's capital and the nation as a whole. Although some believe railroads have reached the peak of their usefulness, it is this writer's opinion that they will continue to serve the nation's capital for a long—long time to come.

The Ham-Don Associates, P. O. Box No. 163, Northfield, Illinois builders of tables for game rooms, dens, etc. with Formica tops with a locomotive design, wish to call the attention of their wares to our membership. The tables run from $19\frac{1}{2} \times 29\frac{1}{2}$ to $19\frac{1}{2} \times 47\frac{1}{2}$, height 19 and 15 inches. Ten locomotive designs are offered of different types on different roads. Prices run from forty to fifty dollars a table. If any of our members are interested in the purchase of one of these tables, we suggest they write the above firm for their descriptive literature.



FORNEY LOCOMOTIVE
1893

South Side Rapid Transit #46. Baldwin 1892.



Courtesy of George Krambles.

Baldwin Cross-compound Forney type for the Chicago South Side Elevated. 1892.

Forneys on the "Alley" El

BY FRED JUKES

As often happens in chemical research, a scientist working toward a definite goal may stumble onto something entirely different. By the same token the "tank-first" locomotive invented by Forney, and patented by him in 1866, failed to make the slightest dent in the field occupied by the old reliable "American" type, as he had fondly hoped it might. It did, however, carve a very useful niche for itself in another service, that of the elevated railway.

Whether Forney's invention was basic is doubtful. His idea was to place the boiler directly over the drivers, and the tender portion above the truck, so that the adhesive weight would not be altered by any change in fuel or water supply, as would be the case with side- or saddle-tank engines. Another advantage: the cab being centrally placed made it an even better riding machine than the eight-wheel type. There's no denying that it has its merits.

Now as to the priority of his invention. If we dig into the annals of British motive-power we find that many of the roads in Great Britain and the Emerald Isle used tank locomotives of the same wheel arrangement, and in comparatively large numbers. The heavy suburban traffic incident to the many big cities was exactly what the Forney type was cut to fit. Over there it was called the "Four Coupled Trailing Bogie," it was used in both main- and branch-line services, and was built in sizes up to forty or more tons in total weight.

Both the South Eastern and the London, Brighton & South Coast railways had these 0-4-4 engines in use at least as early as 1866. The first of the L. B. & S. C. engines of the type weighed something over 75,000 lbs., but by 1892 the road was building them with 18x26-inch cylinders, 66-inch drivers, and weighing 175,000 lbs. Thirty-six of this size were built between 1892 and 1898. The Great Northern (England) built ninety-three; and records show that the North Eastern turned out some two hundred and thirty between 1874 and 1894. So that the "0-4-4 Tank" was not by any means an untried type when America started production on it.

In the case of these British 0-4-4s it must be remembered that they were, with few exceptions, inside-cylindere engines, also that many were fitted with side-tanks; while some carried only fuel in the bunker at the rear end.

In Forney's design the pilot and headlight were placed at the tank end, the engine being supposed to run normally in that direction, but when the type came into its own it was found to run about as well in one direction as the other, and pilots and headlights were often fitted at both ends. Neither was essential in elevated service.

As used on the elevateds the Forney was not a large engine; in fact it was of narrow-gauge proportions in everything but width, and generally much lighter than those used in the British Isles or on the Continent. When running tank first it had the excellent guiding qualities

of the 4-4-0, very desirable when one considers that many of them had to operate on from 48- to 63-degree curves. This means from 120- to 90-foot radius, pretty sharp for standard-gauge track; but their small drivers and five-foot rigid wheel-base enabled them to take these curves with ease.

In general there were few "hills" on the elevateds, and their raised structure called for motive power and rolling stock of light weight.

A little road with a big name, "The Chicago & South Side Rapid Transit Company" was less than nine miles in length. It was really quite a railroad though. Dr. Bernard, its president, who came from the Manhattan Elevated, had been assistant to the B. & O.'s president, and while on that road had acquired quite a reputation as an able organizer. R. I. Sloan was appointed Chief Engineer; and with this team the promoters set out to make the road the finest of its kind in the country.

As no enterprise of any size gets very far without growing pains, so the South Side El. had its troubles and set-backs. Its original plan had been to proceed South from Van Buren Street in the alley between State Street and Wabash Avenue, one side only to be used. It soon became evident that right-of-way could not be purchased in this section without having to cross from one side of the alley to the other too often. As over \$2,000,000 had already been spent for right-of-way an appeal was made to the City Council for permission to build down the center of this alley from Congress to Twelfth. On the night of April 2nd, 1891, an ordinance was passed making this possible; however there were rumors that this action would be vetoed by the mayor. His power to do so expired by limitation on the 9th, so the ordinance became established the following day. The rental paid the city was \$4,000 yearly, a small sum for so valuable a franchise, valuable because it granted rights through such a heavily populated area.

The elevated structure was of four lines of plate girders, one under each rail, supported by columns placed twelve feet apart. This was topped with 90-pound rail with Clarke-Fisher joints. Many a main line carrying heavier power and rolling stock had less. No point of this structure was allowed to be less than fourteen feet above street level, and the maximum width was not to exceed that necessary for three parallel tracks spaced twelve feet apart, center to center, except where needed for stations, switches, curves or turnouts, and not more than a two-track width through the alley. And so, because of its long traverse of the alley between Wabash Avenue and State Street, it became known as the "Alley El"; and so we will call it.

Contrary to accepted practise the "Alley's" stations were placed at street level, a much more convenient arrangement than that on the older elevateds.

The road started operating on June 6th, 1892, in time to prepare for what proved to be a deluge of traffic brought by the great World's Fair at Jackson Park, which was formally opened May 1st, 1893, regardless of much disorder due to many of the exhibits not being in place. The total attendance that day was over 300,000, and of these the Alley is estimated to have carried two-thirds. Dedication Day brought probably 150,000 extra passengers. To handle these crowds five- to seven-car

trains were needed, dispatching them at $4\frac{1}{2}$ minute intervals; but in spite of all efforts this schedule could not be maintained; simply a case of too many people wanting to get to the same place at the same time. A number of jam-packed trains had to run right through, leaving angry passengers stewing on intermediate platforms for as much as an hour at times.

The fact that the Alley's cars were not provided with other than end-doors made loading and unloading slow in any unusual traffic emergency such as that imposed by the Fair.

In this respect the Illinois Central was much better prepared, for during the first six months that road, in its "World's Fair" trains, which were built specially for the service, handled some 8,800,000 passengers; this on a double-track extending from Van Buren Street direct to Jackson Park, and set apart for these trains only. In addition, the I. C. regular suburban trains to the Fair grounds carried over 10,200,000. On Chicago Day, both its services, "World's Fair" and Suburban, carried 509,786 passengers. Here's how it was done: the "World's Fair" specials, consisted of blocks of nine close-coupled cars with much the appearance of the lowly box-car. These had eight doors on each side providing access to seats extending clear across the car; but no end doors. These trains ran through without stop, and tickets, 10c one way and 20c round trip, were surrendered before entering the platforms. Hard to believe, these trains were emptied in as little as 11 seconds after stopping, while loading took a little longer, 15 seconds. This could be accomplished only by having separate platforms for loading and unloading. Tracks were cleared in 55 seconds after arrival and platforms emptied in 80 seconds. It is a question whether, before or since, any such numbers have been handled by an American steam-operated road.

But, getting back to the "Alley"; its trains were scheduled at about 18 miles per hour. They consisted of from five to seven coaches, each of which normally seated 58 passengers. Coaches were finished in light mahogany and furnished with rattan seats placed lengthwise at the ends of the cars and cross-wise at the mid-portion. End doors were double and wide enough for two passengers to pass without inconvenience. Lighting was by Pintsch gas, three four-burner lamps to each car, a convenience much appreciated by those patrons who liked to spend their time en route reading.

On the whole the equipment of the Alley was tops. Not only in this respect was it out in front; Dr. Bernard was responsible for wages being above those paid elsewhere for like services, for Alley engineers got \$3.50 per day for their first six months, rising to \$4.50 by the fourth year. On the Manhattan Elevated the rate was \$3.50, the latter for an $8\frac{1}{4}$ -hour trick against the Alley's seven hours. While these figures might mean short rations today, prices current in the '90s made them spell comfortable living.

The Alley's locomotives, like the rest of its equipment were of the latest and best. Designed and built by the Baldwin Works they were, with one exception, Vaucrain compounds. The original order of twenty was taken through from Philadelphia to Chicago as a single train, hauled

by another Vauclain, a 10-wheeler. Not long after an additional twenty-five were delivered, built to the same design; also a cross-compound for test purposes which, except for its cylinders, was a duplicate of the others. This one was numbered 46 and is shown in the drawing. The smaller sketch shows the Vauclain cylinders, crosshead, piston-rods, guides etc., and the rather unusual arrangement of the link-motion, where the eccentrics are on the forward rather than the driving axle. This brings the concave face of the link toward the front. As fitted to the Vauclains the piston-valve chambers on each side of the engine are part of the casting that includes the half-saddle and high- and low-pressure cylinders for that side. The valve-chamber is behind the cylinder and its center line about the same level as the lower guide-bar.

The piston-valve is moved by a flat curved transmission-bar extending from the link-block forward beneath the axle to the valve-stem. The back end of this bar is supported by a hanger whose fulcrum is just above the engine frame. The link itself is raised or lowered in the normal way in cutting-off or reversing.

While following the generally accepted design for elevated work, these Forneys had rather higher power than those on the New York City roads. Compounding was much in favor in elevated service, where high speed was not an essential but quiet operation was. The soft exhaust of the compounds went far to accomplish this end without the evil of back-pressure introduced by the use of a muffler. Pops were muffled, and a tiny whistle tooted its messages to one and all.

The Alley Forneys had neat capped stacks, large steam-domes, and four sand-boxes placed beneath the running boards, and their outline was such as to make them very handsome little engines. The two-cylinder compound had 14 and 20 by 16-inch cylinders, the Vauclains 9" & 15" by 16". Both had 42" diameter drivers, a rigid wheelbase of 5 feet, and a total wheelbase of 16 ft. 4 in. The height to the top of the stack was 11 ft. 8 $\frac{3}{4}$ in. from the rail, and the total weight 29 tons, of which 20 tons were adhesive.

A larger-than-usual grate area was provided as both coke and anthracite coal were used to insure smokeless combustion; and the straight-topped boiler carried steam at 180 pounds working pressure.

As a protection to street traffic below, overflow from the injectors, water from the cylinder cocks, and oil and grease from the working parts had to be kept on the engine. Injector overflow was carried back to the tank; a large cinder pocket below the front end took the drainage from the opened cylinder-cocks, quenching any hot cinders (the pipe shows just ahead of the cylinders) and any dropping oil or grease was caught in drip pans below the rods and motion. These drip pans were emptied at engine terminals. One safety feature was the use of inside check-valves to eliminate the danger of passengers or crew being scalded by the possible breaking of an outside check in a wreck.

Vauclain cylinders and half-saddle were interchangeable, and the frames on each side were one piece from front to rear, being deepened at a point abreast of the truck center-pin. The blower consisted of a circular ring placed round the exhaust nozzle and perforated with drilled holes.

The sides of the tank and cab were of one sheet of steel, and it will be noticed that the water tank has an extension under the cab except for the center portion, which is formed of a flat steel deck extending from the boiler-head back under the fuel space. The top of the tank is covered with a wood floor, and steel running boards are used. Contrary to usual practice the side-sheets of the tank have no flare or collar at the top as is shown on the end sheet.

That the Baldwin Works built a cross-compound may be news to some. It was similar in operation to the Pittsburgh Compound, but its output was practically nil as the Vauclain was being pushed the world over, literally from Pike's Peak to Siberia and from Norway to New Zealand.

Where most of the elevateds used the Eames Vacuum Brake, the Alley went in for Westinghouse Automatic, continuous through engine and train, no independent driver brake being provided.

Looking at these little Forneys from all angles they may be regarded as having been the finest examples of their type as used on elevated roads. At the close of the Fair twenty of them, by a prior agreement, were turned over to the Metropolitan Elevated of Chicago, which company was controlled by the same interests as the Alley. This was in 1894. Even then the advantages of electric traction were becoming apparent, the road's engineering department stating that steam was found to be economical only with five or more cars, and could not compete with motorized cars on a line like the Alley, where stations were such a short distance apart.

The Metropolitan had started using motors in 1895 and the Alley was awaiting the outcome of the "Met's" experience before embarking on the change itself. It was truly the period of twilight for steam on the elevateds.

Electrification superseded steam on the Alley in April, 1898, after its having been absorbed into the Loop on Oct. 18th, 1897, and the little Forneys were scattered to the four winds. They first went to second-hand dealers such as Southern Iron & Equipment Co., Georgia Car & Foundry Co. and others, who worked them over for resale. Some of them found their way to steel mills, others to logging camps, sugar plantations or whatnot. It is doubtful if any are to be found today within the confines of the United States, unless as attractions in parks or the like. As they were displaced by electricity over sixty years ago, the service of these fine little Baldwins on the Alley was of short duration.

Of the millions of passengers, to whom the steam-operated elevated trains and the softly-puffing little engines that pulled them, were part and parcel of their everyday lives, comparatively few are left who can say "I used to ride behind 'em." And each year the members of that little band grow fewer.

(The author wishes to acknowledge the kind offices of Mr. Geo. Krambles, of the Chicago Transit Authority, who furnished the photo of Eng. 46 and information as to dates in the Alley's operation; also his thanks to Mr. R. B. Carneal, of Durham, N. C., for data on the roads construction and rolling-stock. F. J.).

Railroads of the First and Second Anthracite Coal Fields of Pennsylvania

By EARL J. HEYDINGER

There are few, if any, parts of the country which have been the scene of more railroads, or have witnessed their growth from the earliest days, than the First and Second Pennsylvania anthracite coal fields centering chiefly in Schuylkill, Carbon and Northumberland Counties. In the following articles, the author has assembled the records of the founding and development of these early roads, most of which ultimately became components of larger railroad systems that exist today, although many of these components have long since been abandoned because of the depletion of the coal fields in the areas they primarily served.

The author has arranged the lines into nine groups, those in each group bearing some association with each other, and will treat them in the following sequence.

1. The railroad of the First Coal Field centering at Pine Grove, viz., the Union, Swatara, Lorberry Creek, Dauphin & Susquehanna-Schuylkill & Susquehanna, Allentown Railroad, and the railroads of Dauphin County.

2. Influence of the Schuylkill Navigation Canal; the arrival of the Philadelphia & Reading Company; the Mt. Carbon & Port Carbon R. R.

3. Schuylkill County activity, 1827-28; the Mill Creek and Schuylkill Valley Railroads.

4. Mine Hill & Schuylkill Haven R. R. in the First and Second Fields.

5. The Mount Carbon; Danville & Pottsville-Philadelphia & Sunbury; Shamokin Valley & Pottsville Railroads.

6. Little Schuylkill Navigation Railroad & Coal Company; East Mahanoy; Little Schuylkill & Susquehanna-Catawissa, Williamsport & Erie-Catawissa; Tamaqua, Hazleton & Northern; and the Delaware, Susquehanna & Schuylkill Railroads.

7. Mahanoy & Shamokin Railroad.

8. Railroads in the Lehigh Valley & Pennsylvania R. R. groups, viz., Beaver Meadow; Hazleton; Sugar Loaf; Buck Mountain; Lehigh Luzerne; Quakake-Lehigh & Mahanoy; Sunbury, Hazleton & Wilkes-Barre; and Nescopee Railroad.

9. Railroads of the Lehigh Coal & Navigation Company, viz., Mauch Chunk; Nesquehoning; Lehigh & Susquehanna; Tresckow; Lehigh & New England.

This article will appear in several installments. The first covers the railroads of Group 1, inclusive. Others will appear in subsequent issues of the Bulletin.

(Editor)

RAILROADS OF THE FIRST COAL FIELD CENTERING AT PINE GROVE

Because of the five pioneer Schuylkill County Coal Field railroads only the Little Schuylkill Navigation, Railroad and Coal Company employed locomotives, too little attention has been paid to the heavy tonnage carriers in the First and Second Coal Fields. The development of these many coal roads forced the construction of the Philadelphia & Reading and the Lehigh Valley Railroads. While the first lines' traffic traveled only on favorable grades, Broad Mountain had been crossed in less than a decade. This paper will attempt to present the history, development and contributions of these early roads as their importance deserves.

In the United States, as in England, the first railroads, with few exceptions, linked coal mines with waterways. Even as the Schuylkill Navigation Canal linked the Pottsville coal area in the First Coal Field with tidewater at Philadelphia, railroad advocates, on November 25th, 1825, proposed a link from Pottsville to the Susquehanna's forks at Sunbury. The Pottsville *Miner's Journal*, on March 25th, 1826, carried Strickland's diagram of the Hetton Railroad of England, illustrating inclined planes, contemporaneously with Philadelphia, New York, Baltimore and Boston papers. This wave of railroad interest generated two Pennsylvania charters in 1826; the Danville & Pottsville, surviving today as the P. R. R. from Sunbury to Shamokin; and the Union Canal Railroad, a 3.4-mile component of the Reading Company today, north of Pine Grove in western Schuylkill County, and the basis of that line's claim to an 18th century corporate origin.

The Union Canal Railroad

The Union Canal Company, of 1811, a successor corporation to the Schuylkill and Susquehanna Canal of 1791, received legislative sanction on March 3rd, 1826, for a railroad from Pine Grove, the head of its branch canal on Swatara Creek, into the hard coal regions of western Schuylkill County. This branch canal had carried traffic from Pine Grove by December 3rd, 1830, three years after the main canal had opened. However, two years elapsed before the strap rail line carried coal to the canal from Lorberry Junction.

According to P. W. Schaefer, pioneer Schuylkill County mining engineer, the Union Canal, between 1833 and 1861, received over a million tons of anthracite over this tiny railroad, small tonnage, however, when compared with that carried by the L. C. & N. Canal, the Schuylkill Canal, and the P. & R. Horses were the motive power for this road and its privately owned extensions into the coal fields until 1848. Traffic grew slowly. Competition through a pioneer Schuylkill Valley line, the Mine Hill & Schuylkill Haven, crossed the feeder line, the Swatara R. R., in 1847, at Tremont. Peak tonnage of 72,146 tons in 1849 passed through a canal with locks only 8½ feet by 75 feet.

During 1849, coal producers in the Swatara region requested that the Union Canal R. R. be doubletracked with heavier rail so that Swatara locomotives might operate into Pine Grove and replace horsepower. These producers threatened to switch their tonnage to a proposed railroad via Fishing and Stony Creeks to the Susquehanna, the Dauphin & Susquehanna Coal Company's original line. By 1851, the Union Canal R. R. had laid 60-lb. rail. Enlargement during 1851 reduced the U. C. coal traffic to zero, but 1853 brought nearly 65,000 tons over their road. Canal traffic dropped 20,000 tons when the Lorberry Creek R. R., a feeder line financially interested in the D. & S. R. R., directed its coal westward from Pine Grove in 1854, and eastward to the P. & R. at Auburn, in 1855. By 1856, however, tonnage over the canal rose to nearly 80,000 tons, the all-time peak, despite the speedier rail transportation available at Pine Grove. Even with this traffic and 15x90-foot locks, the Union Canal was unable to earn six percent for its \$3,000,000 enlargement bonds. Nature in the form of a flood, on June 4th, 1862, wiped out the branch Union Canal and its reservoirs above and below Pine Grove.

Less than a month later, July 26th, the Reading leased the U. C. R. R., linked to the P. & R. by their then-controlled Schuylkill & Susquehanna R. R. In January, 1866, the P. & R. purchased this railroad and the Union Canal right of way from Pine Grove to Jonestown. Subsequently the P. & R. built the Pine Grove & Lebanon and the Lebanon & Pine Grove Railroads, later the Lebanon & Tremont R. R., over this route.

The Lorberry Creek Railroad

The Lorberry Creek Railroad, incorporated on March 30th, 1831, was the most profitable coal line linking with the Union Canal R. R. at Lorberry Jet., between Sharp and Second Mountains where coal began. This road had its financial backing in New England. Daniel Tyler, of Norwich, Conn., later a member of the Philadelphia coal firm of Tyler, Stone and Company, owned considerable coal acreage in the Swatara Region, and in the Dauphin & Susquehanna Coal and R. R. Company. The Lorberry Creek operated from Lorberry Jet. to Lorberry Colliery by 1835. That year the line requested permission for a toll increase in order to replace strap-and-wood rail with heavier iron. There were three collieries on the line by 1839.

Before 1840, the D. & S. Company cited the Lorberry Creek profits to promote sale of the D. & S. stock. Lorberry made \$.75 a ton at the Pine Grove wharf, with coal selling at \$2.50. Costs were \$1.00 for mining, \$.35 for hauling, \$.25 for plane toll at the head of the Union Canal R. R. (this plane rose 150 feet in a half mile), \$.35 for U. C. R. R. toll, and \$.15 for miscellaneous expenses. Profits allowed replacement of strap with T-rail by September, 1841, and an eight percent dividend in the depression year of 1842.

The ability to earn an eight percent dividend in 1852 encouraged the Lorberry group to plan an extension of their line along Rausch and Fishing Creeks to join with the D. & S. and other Schuylkill County roads. (The Fishing Creek, Swatara, and Schuylkill Railroad had been incorporated in 1831 and 1844. There are three Rausch Creeks in the Swatara area.) The Lorberry-Tyler interests concentrated their investment in the D. & S. By 1858, Lower Rausch Creek Colliery added its coal to the line's traffic. The fact that George R. Roberts, later president of the P. R. R., was head of the L. C. R. R. for many years may account for its profitable operation.

A month after the P. & R. leased the U. C. R. R., it purchased 992 of 1041 Lorberry Creek shares, and independent operation of that road ceased. The productivity of this coal railroad and its coal lands is reflected in the coal furnished to the Federal Navy in 1862, by Tyler, Stone and Company. Because of slow government payments, this coal company owed the Reading over a quarter million dollars in freight. In this financial emergency the L. C. received an advance from the P. & R., which may later have influenced sale of the Lorberry Creek to the Reading.

The State Report of 1863 described the L. C. R. R. as extending 5.5 miles from Lorberry Jet. to Lorberry Mines, having 6.5 miles of 60-lb. rail, without ballast. Using P. & R. rolling stock, the line carried 179,030 tons of anthracite and 4433 tons of other items to produce \$93441.94 in receipts, but at a loss of \$5827.00. The Report of 1870 credited the road with a 13-mile main line from the Junction to Clarks Valley and 2.3 miles of siding. On this line were two bridges and 400 feet of trestling, and 64-lb. rails on stone ballast. Lincoln and Kalmia Collieries opened at this time.

The Swatara & Good Spring Railroad

The Swatara & Good Spring Railroad was the second line delivering hard coal to the Union Canal R. R. at Lorberry Jet. Incorporated on April 2nd, 1831, this line planned to build up Good Spring Creek to the heart of the coal region. In 1841, the road's title was changed to the Swatara Railroad. During the next two years, the Donaldson Improvement and R. R. Company (renamed Donaldson Improvement Co., on April 20th, 1853) extended the road to its mines at Donaldson. Judge Wm. Donaldson, whose property titles involved search into the Robert Morris papers, was president of both the Improvement Company and the Swatara Railroads until 1863, and purchased T-rail from the Lehigh Branch of the L. S. & S. for his railroad after the 1841 depression. In February, 1841, he requested that no toll for T-rail movement over the Union Canal be charged to his road. Horses powered the line until legislative action in 1848 authorized the use of mine-owned locomotives and cars. Five years later, the Legislature allowed the Swatara to issue \$100,000 six percent bonds for line improvement, and in March, 1859, allowed the Donaldson Company to issue seven percent bonds.

In 1859, Poor's stated that the six-mile line had been completed to Donaldson in 1844, and that the Swatara R. R. leased the Union Canal R. R. and its 2¼-mile branch. Capital was \$32,300. Equipment consisted of two locomotives, three trucks, a passenger car, and 168 coal cars, all of which had cost \$41,780. Neither the \$100,000 funded nor a floating debt was mentioned. (One locomotive was a Baldwin 0-8-0, C/N 658, 1855. "Colonel Paxton." Cylinders 16"x20". DD 38½". Sold to the Lackawanna & Bloomsburg R. R. about 1863, and becoming that road's No. 12. Scrapped in 1874. Ed.). Of the \$13,161 in receipts for 1859, \$12,003 came from coal traffic.

Inability to provide a clear title prevented Donaldson from accepting an offer of \$100,000 from the P. & R., in 1860, for the Swatara. The Lancaster, Lebanon & Pine Grove R. R., incorporated on March 28th, 1846, enters the Swatara story through the appointment of Donaldson, G. Dawson Coleman and A. Bates Grubb among its commissioners. The last two were proprietors of blast furnaces and of the famous Cornwall ore mines. The supplemental act appointing them passed March 17th, 1863, was possibly an attempt by Donaldson to extricate himself from his financial involvements, and to save his interests in the Swatara and Donaldson Improvement Railroads.

In the meantime, the P. & R. had purchased all outstanding judgments and liens against his lines. After purchasing the Swatara at a Pottsville auction, on January 24th, 1863, the P. & R. conveyed the property to its Good Spring R. R., incorporated April 8th, 1861. When purchased, the Swatara included a partly-graded branch northeastward from Tremont up Middle Creek, where coal lands in 1870 belonged to the same company owning the Donaldson workings. In 1868, an eight-mile extension carried the end of Good Spring rail to coal at Brookside, in Dauphin County. Here, a 1956-switchback carries Reading Company traffic via the Williams Valley R. R. to Lykens, Pa. The State Report for 1870 credited the Good Spring with 20.5 miles of track. The P. & R. furnished all equipment but operated the line as an independent branch, until consolidation on March 25th, 1871, with the Pine Grove & Lebanon, the Lebanon & Pine Grove (lines built to the Schuylkill County line in different counties), the Lorberry Creek and the Union Canal Railroads into the Lebanon & Tremont R. R. On May 8th, 1871, the L. & T. was merged into the parent company. Extensions of the L. C. and Swatara Railroads will be discussed with the Dauphin County railroads of the First Coal Field.

The Swatara Branches of the Mine Hill & Schuylkill Haven R. R.

The pioneer M. H. & S. H. carried coal from Tremont in 1847, and built its Swatara and Middle Creek Branches between 1849 and 1852. By 1852 Mine Hill competition hurt the Union Canal. In 1856, this line crossed the Swatara R. R. to build its Mt. Eagle & Tremont R. R., incorporated April 29th, 1853, tapping the coal lands of Henry K. Strong, a prominent Schuylkill County politician. All these Mine

Hill branches carried considerable coal, but in quantities only sufficient to pay small returns.

Today, south of Tremont, three parallel lines of road are visible. From west to east they are:—the 1856 Mt. Eagle branch of the Mine Hill, the Swatara (Good Spring), and the 1847 Tremont branch of the Mine Hill. In coming from the Schuylkill Valley at Westwood, the Mine Hill climbed from 608 feet to a summit of 864 feet, and then descended to 763 feet at Tremont.

Dauphin County Railroads in the First Coal Field

All of the lines described to this point were completely within Schuylkill County except the Lebanon & Pine Grove to the iron city of Lebanon. By switchbacks the Reading extended both their Good Spring route into Lykens, in the Wisconsin Valley, and their Lorberry route into Clarks Valley, in northeastern Dauphin County. Both valleys drain into the Susquehanna River and form the fishtail of the First Coal Field. U. S. Topographic Maps of 1892 and 1893, reprinted in 1936 and 1939, locate the now-abandoned Clarks Valley switchback. Climbing to above 1400 feet out of Lorberry Creek, the westernmost point of the upper switchback was at 1250 feet. Kalmia Colliery and the eastern point were at 1150 feet, while the lower section extended down Clarks Creek nearly 6.5 miles from Kalmia to the 700-foot level. The abandoned right of way can be seen in 1956 from Gold Mine Trail, between Tower City and Lickdale.

The Good Spring-Brookside switchback, existing in 1956, parallels Big Lick Mountain at levels from 1400 to 1200 feet, while Lykens station is near 650 feet. There never was any physical connection between this Reading branch and the P. R. R. at Lykens, though authorized in 1870.

The Williams Valley R. R. received legislative sanction on September 19th and November 24th, 1891, to build 7.2 miles from Lykens to Brookside on the Good Spring Branch. Train operations began on July 1st, 1892. Tonnage in 1894 consisted of 5287 of anthracite and 12,022 in miscellaneous freight. Capitalization in 1896 was \$90,000 in stock and \$87,000 in five percent bonds. By 1906, the P. & R. owned \$20,000 in bonds. Operating deficits by 1909 were \$15,685. When taken over by the Reading, between June, 1908 and June, 1909, one locomotive, the "A. F. Baker," No. 1, came to the parent company, becoming No. 1460. It was a Baldwin 2-6-0, shop number 12806, 1892, having 18"x24" cylinders and 54" drivers, and was scrapped by the Reading in 1916.

An item in the Harrisburg *Patriot* of September 27th, 1956, stated that steam locomotives would replace Diesels on some Reading Company coal lines; especially mentioned was the Good Spring-Lykens switchback.

The Lykens Valley Railroad

Jacob Burd, Sr., and Peter Kimes discovered the famous Lykens Valley red ash coal in 1825, near Short Mountain. Philadelphian Simon Gratz purchased the land in and east of Bear Gap and, in 1831, organ-

ized the Wisconisco Coal Company. The next year coal was mined at the Gap. English engineer Ashwin located the railroad of the Lykens Valley R. R. & Coal Company, incorporated April 7th, 1830, the first line in Dauphin County. In 1831, *Hazard's* reported that this line was to be extended into Schuylkill County. It was completed in 1834 with strap rail and for horse power by engineer John Paul, and the first coal via Millersburg went down the Susquehanna in arks during March and April. Soon coal cars crossed the river via a crude car ferry to Mt. Patrick on the Penn State Canal. Captain Faunce's boat No. 76 departed on April 19th, 1834, with 43 tons of hard coal for the Columbia, Pa., market. Thomas Borbridge, credited with the shipment of 99 arks of coal from the Wilkes-Barre region in 1797, purchased this first shipment of Lykens Valley coal.

Dauphin County interests secured a twelve-mile canal with seven locks to overcome the 24-foot fall along the eastern shore of the Susquehanna from Clarks Ferry to Millersburg. By 1844, Pennsylvania transferred the uncompleted canal to the Wisconisco Canal Company, who completed the line to Millersburg, the total cost being \$450,000. Until the Northern Central passed through Millersburg in the mid-1850's, this canal carried the entire Lykens Valley output to market in 80-ton boats. However, the strap rail wore out by 1844 and, until re-graded and laid with 50-lb. rail in 1848, the tonnage was minimal. The first locomotive to operate over this line and the new rail was the "Lykens Valley," about which nothing else is known at this time.

By 1862, the canal carried 84,299 tons of the Lykens Valley 141,581 tons delivered by rail to Millersburg. This same year the Lykens Valley R. R. paid eight percent on a \$400,000 investment. Cost of the road was given as \$415,000. Equipment on the 16-mile line consisted of three locomotives, and one each passenger car, baggage car, and freight car, all four-wheeled. No coal cars were owned! In 1859, they were furnished by the coal operators. The single passenger car had carried 3200 travelers.

The Summit Branch R. R. leased the Lykens Valley on April 13th, 1866, for \$62,000 and taxes. In 1868, the Wisconisco Canal had lost \$200 in shipping 80,000 tons of the 513,347 brought to Millersburg by the Lykens Valley R. R., and had been purchased by the P. R. R. for its canal system, at a judgment sale. The million dollar cost of the road included twenty miles to Williamstown, five engines, no passenger cars, a single baggage and two freight cars. Along the line were four stations, four wood-and-water stations, and five engine houses. The passengers, 12,357 in number, rode 1016 miles. Over a half-million tons of anthracite produced \$138,167 in receipts. While expenses were over \$220,000, a six percent dividend had been declared. On December 10th, 1873, a mining tunnel extended the line to Bear Valley.

The Pennsylvania Shareholders Report for 1874 revealed that that road owned over half of the Summit Branch, which, in turn, controlled approximately 70 percent of the Lykens Valley R. R. The 12,200 acres of coal land thus controlled cost the P. R. R. \$1,495,024 and had a value in 1874 of seven millions. However, because neither the L. V. nor the

S. B. Railroads owned coal cars, in 1873 over 400,000 tons of hard coal loaded in P. & R. cars traveled on the Northern Central only to Dauphin, where it was switched to the Schuylkill & Susquehanna for Philadelphia delivery by the Reading. Purchase of 600 to 1000 coal cars by the Summit Branch would transfer this vast tonnage and over \$400,000 in revenue to the Pennsylvania.

On July 1st, 1880, the Northern Central leased the Summit Branch. Direct N. C. operation began on April 20th, 1896. P. R. R. interests purchased the Summit Branch at a foreclosure sale on July 13th, 1897. Coal mining in the Lykens area tapered toward zero after World War II.

The Northern Central Railroad

Outlet for Lykens Valley coal, and the lessor of the Danville & Pottsville R. R., had a corporate predecessor for the same route, the Harrisburg & Sunbury R. R. of 1837. Baltimore capital had merged several railroads, including the pioneer Baltimore & Susquehanna, which aimed to secure Susquehanna traffic in 1828 at York Haven, and paralleled the Susquehanna River from York Haven to Sunbury before 1861. In the financial flurry attending the beginning of the Civil War, the B. & O., controlling the road with the P. & R., threw their shares on the market. The Pennsylvania promptly bought this stock and soon acquired control.

The Susquehanna R. R., incorporated on April 14th, 1851, the means of construction between Harrisburg and Sunbury, contracted for the entire line between Bridgeport and Sunbury. The opening, on July 24th, 1857, to Port Treverton, via the Treverton Bridge to the west shore of the Susquehanna, required canal packet and canal boat travel to Sunbury. The mixed system lasted until June 28th, 1858, when the Northern Central opened its whole line. The 9:00 A. M. passenger train from Harrisburg covered the 54.5 miles to Sunbury in six hours.

Among the lines proposed to tap the northern prong of the First Coal Field fishtail in Dauphin County were the William Valley Rail Road & Mining Company, and the Union Rail Road & Mining Company, of 1839-40, both financed by Harrisburg capital. The Williams Valley plan called for a two-mile tunnel completely through Big Lick Mountain from the floor of Wisconsin Valley to Rausch Gap, thereby cutting every coal vein. Unfortunately, the coal pitched northward, opposite the slope of the mountain and, as a result, the eighty yards excavated failed to reach coal. This "Red Shale Tunnel" is visible today at the head of Seventh Street in Tower City. The railroad was to have run southwesterly from this tunnel to and down Clarks Creek Valley to the Susquehanna. Joseph W. Cake was president and Hother Hoge was chief engineer, with headquarters at Pine Grove. Litigation over land titles ruined the company. On May 7th, 1855, this corporation revived as the Schuylkill and Dauphin Improvement Company. That the tunnel plan was feasible is proven by a similar post-War II project of the P. & R. Coal & Iron Co., in this same valley.

The Union R. R. & Mining Co., capitalized at \$300,000, and authorized to own 2000 acres of coal lands in Dauphin and Schuylkill Counties, planned to mine coal in the Bear Valley Basin, but built no railroad. The Midland of Pennsylvania R. R. of 1910, revived in 1914, reported that ten miles of its 44-mile line between Millersburg and Ashland in the Second Coal Field, via Gratz, Sacramento and Gordon were partly completed. This company never laid track.

Dauphin & Susquehanna—Schuylkill & Susquehanna— Allentown Railroads

Less than a year after the discovery of anthracite on Stony Creek, in Dauphin County, the Dauphin and Susquehanna Coal Company secured corporate rights. This charter of April 5th, 1826, allowed the company to own 10,000 acres of coal lands on Short Mountain and Stony Creek, and the right to trade in coal. This property was in Dauphin, Lebanon and Schuylkill Counties, on the southern prong of the First Coal Field. Port Lyon, later Dauphin, on the Pennsylvania Main Line Canal, was the proposed market outlet, but capital for the project did not materialize. A supplemental act of April 11th, 1827, authorized either slackwater or canal navigation on Stony Creek to the mines. In April, 1838, the Legislature authorized either a railroad or a canal and, by 1840, engineer Edward Miller had located thirteen miles from Rattling Run to Dauphin, and had surveyed nineteen additional miles, viz., eleven miles to the summit of the valley and eight to the Union Canal Branch. Extensions to Reading and Pottsville were under consideration. Permission to link the company's proposed railroad with other lines in Dauphin and Lebanon Counties came in March, 1848, and February, 1850.

Construction between Rausch Gap and Dauphin began in 1850 under engineers Miller and Charles R. Paxton. The company opened mines at Fort Lookout, Beartown and Big Flats. At Yellow Springs, near the Dauphin-Lebanon County line, an inclined plane fed coal southward to the main line from coal drifts on the mountain. Rausch Gap was the location of the company's headquarters and machine shop, and a breaker between the main line and veins in the Gap above. The three-mile branch, beginning at this Gap, extended eastward and paralleled the main line at a higher level past Gold Mine Gap and breaker to Black Springs Gap. At Rattling Run a highway through the Gap connected the railroad with coal veins. With abandonment of the Rausch Gap shops and mining, and merger of the S. & S. with the Reading in 1872, the houses at the various breakers and at the Rausch Gap shops were moved by rail into Pine Grove. Railroad repairs began at Pine Grove Shops with the move.

On February 26th, 1852, the D. & S. Company was authorized to extend their rail line to the P. & R. and the Schuylkill Navigation Canal at Auburn. Delivery of D. & S. and other coal in P. & R. and S. N. C. coal cars was one goal of this extension. This proposed section of the road was on the route of the Fishing Creek, Swatara & Schuylkill R. R.,

from Fishing Creek to Auburn, via Pine Grove. Location began during September, 1852, under engineers Richard O. Osborne and Henry K. Nichols. The new line insured an immense coal traffic from the west end of the First Coal Field basin to the P. & R.

The D. & S. report for 1852 stated that the company had a first class T-rail line of 29½ miles with descending grades to their \$41,000 Dauphin Canal Basin. A three-mile lateral to Gold Mine, Black Springs and Rausch Gap mines, and those at Yellow Springs, Fort Lookout, Beartown and Big Flats produced 23,472 tons of coal transported by three locomotives and 529 cars. Contracts were under way for thirty-one miles of T- or 60-lb. bar rail, to link the road with the Reading and the Schuylkill Canal at Auburn. The company had floated a million dollar loan in bonds without offering them for public sale. Though mainly financed by New York capital and aided by the Tyler coal interests on Lorberry Creek, John Tucker, president of the P. & R., was a director in 1851.

The Auburn-Pine Grove section, completed November 4th, 1853, was opened to traffic on February 1st, 1854, and the Pine Grove-Rausch's Gap link opened during June. The first D. & S. locomotive to enter Pine Grove, the "Judge Hegins," attracted a crowd of over a thousand. Yet another link, trackage rights over the P. R. R., enabled the road to run into Harrisburg, during February, 1854. In 1854, the movement of coal at Pine Grove showed that the D. & S. carried less than 40 percent of the coal passing over the Union Canal R. R.

With completion of the Pennsylvania from Pittsburgh to Harrisburg, the D. & S. Company caught the "through line fever." A forty-mile extension from their chartered terminus at Auburn to the Lehigh Valley at Allentown would make it a part of the "great Atlantic and Pacific Route." D. & S. interests secured a charter for the ALLENTOWN RAILROAD, on April 19th, 1853, linking Allentown with Port Clinton, and for the AUBURN & PORT CLINTON R. R. on March 30th, 1854, to parallel the Reading between those towns in the Schuylkill Valley. Exactly a month later, the Legislature passed an act enabling the Allentown R. R. to consolidate with the Lehigh Valley and/or the Auburn & Port Clinton.

The latter road graded part of its line before merging with the Allentown on January 1st, 1857. Part of this right of way is visible, in 1956, on the right of the Reading below Auburn. Engineer Elwood Morris located the Allentown route, and construction on the entire contract began on March 9th, 1857, by Pierre Chonteau, Jr., of New York. When the depression of 1857 slowed stock installment payments and prevented European sales, by mutual agreement the railroad and Chonteau cancelled the construction contract. However, work continued with individual contractors being paid in stock. Work accomplished included grading and many still-existent stone viaducts between Port Clinton and Allentown and an uncompleted 2000-foot tunnel between Hamburg and Virginsville in Berks County. The editor of the Kutztown *Geist der Zeit* boosted stock subscription and invested personally. One story told how \$5,000 in Allentown stock was purchased years later by

the P. & R., and with the proceeds the investor's heirs bought a tombstone for him. Allentown R. R. subscribers received D. & S. stock as a bonus, which, the D. & S. reported as amounting to \$395,739, in 1859, and *Poor's* told that actual Allentown stock receipts during that year had been \$304,118, of which \$237,840 had been expended when construction ended.

The Reading *Berks and Schuylkill Journal* constantly informed its readers about the D. & S. and its Allentown R. R. link, because of the financial and traffic competition with Reading area interest in the Lebanon Valley and East Pennsylvania Railroads, also linking Harrisburg with Allentown. Completion of the D. & S. to Auburn in September, 1853, to Harrisburg in February, 1854, the activity between Port Clinton and Allentown in November, 1855, and the financial backing of this route by New York bankers in 1857, were all duly reported. One paper noted the Reading's operation of a Philadelphia-Harrisburg passenger train via Auburn and the D. & S. soon after completion, and reported the end of this run in May, 1855. A P. & R. advertisement of a reduction in fare for this trip to \$3.00 appeared in December, 1857, six months after passenger service began on the Reading-sponsored Lebanon Valley R. R. This indirect Philadelphia-Harrisburg passenger service ended again during March, 1858. The attempted consolidation of the D. & S. with the Allentown R. R., during February, 1858, as allowed in an act of May 4th, 1857, was reported in the *Journal*, which presented the Allentown R. R. as a direct threat to the East Pennsylvania investment and as a line totally unnecessary, even after traffic began on the East Penn to Allentown and New York. To "end the need" for the Allentown road, the East Penn finally built a branch from Temple to Tuckerton, known locally as the "Bull Run" branch. Abandoned for many years, its right of way can still be seen at Tuckerton, north of Reading.

Despite production of 35,000 tons of coal at a profit of \$35,000 in 1854, under the superintendence of Wm. Grant, an experienced Schuylkill County mine operator, the company suffered financially due mainly to its rail expansion. The sheriff of Lebanon County advertised the coal and railroad property, a threat ended by injunction action. The depression of 1857 bore down on the company, despite a coal traffic of 80,000 tons. By May, 1858, the D. & S. made an assignment to P. Chonteau, Jr. This effort ended in a foreclosure sale in March, 1859, which ended merger efforts. On April 28th, 1859, the D. & S. Coal & R. R. Company emerged from re-organization as the Schuylkill & Susquehanna R. R. Company.

Before the foreclosure, the D. & S. represented an investment of \$6,208,325. Among its debts were the following:—

Coal lands, 41,801 acres	\$1,300,000
1851 Railroad, Rausch's Gap to Dauphin	699,229
Extension to Auburn	1,052,550
Canal Basin at Dauphin	41,100
Locomotives and cars	188,146
Bonus to subscribers of Allentown stock	395,739

Rolling stock consisted of seven locomotives and 33 cars. Of the latter, 24 were freight, 2 were coal, 3 were first class passenger cars, and 4 were second class. Average annual income between January 1st, 1855, and March 1st, 1859, had been \$104,213, expenses were \$75,903, leaving average net earnings of \$28,310, far insufficient for interest requirements.

The P. & R., delivering Lykens Valley coal to Philadelphia, and owning the Lebanon Valley R. R. and an interest in the Northern Central, desired a connection between its lines; it secured legislative approval on April 9th, 1859, for the link and ordered its construction the following January. When the P. R. R. tendered trackage rights over the same route, effective November 1st, 1860, construction ended. At the other end of the road, in September, 1859, the S. & S. failed in an attempt to cross the P. & R. and to reach the Schuylkill Canal.

Prodded by S. & S. control of the Allentown R. R. with its shorter route to market, the decreasing tonnage from the S. & S., and the possible penetration of the Allentown line into the Pottsville region, the Reading began negotiations for lease of the S. & S., in 1860. Failure of coal production from S. & S. lands to earn the road's interest charges led that road to propose sale of the railroad with its coal lands and the Allentown R. R. to the P. & R. A committee from that road reported favorably on this proposal and, on July 12th, 1860, controlling interest in both the S. & S. and the A. R. R. came to the Reading. In August, P. & R. officials took all S. & S. offices. The *Journal* reported the new control of both lines, adding a mis-statement that Lebanon Valley competition had drawn all traffic from the S. & S. except 3036 tons of anthracite. The Reading report of 1862 told that \$517,865.33 had purchased the majority stock of both roads, noting that the line from Auburn to Port Clinton was partly graded and the section between there and Allentown nearly completed. At the merger of 1872, the P. & R. valued the 21,702 shares of S. & S. stock at \$404,388.00. The P. & R. also acquired 7500 shares of A. R. R. stock on which \$20 per share was unpaid, and created a trust for the unpaid assessments. Court action against subscribers followed.

For the proposed Manufacturers & Consumers R. R. of 1868, Engineer Rufus A. Wilder investigated and recommended the partly-graded Allentown road for one of the possible routes to the Lehigh River, as if it were readily available for purchase and use. At this very time, the Reading was ready to renew construction on this route as its part in the Atlantic & Great Western lease of the Catawissa and Morris & Essex Railroads. With this construction the P. & R. cancelled the trust set up to collect the unpaid \$150,000, and actually built a railroad from Topton, on the East Penn, three miles to Kutztown, opened on January 10th, 1870.

In 1873, the Allentown R. R. capitalization was \$2,000,000, of which \$567,544 was paid in. There was no funded debt, but the floating debt was about \$1,000,000. The Reading leased the Kutztown section of the A. R. R. by a verbal agreement until the reorganization in 1896. The

line existed as a corporate entity until December 31st, 1945, when the Reading Company ended its existence by merger.

At the request of the Navy Department, during World War II, the entire S. & S., with the exception of a short section at Auburn, was scrapped. Before this scrapping, however, the burning of the covered bridge over the Swatara at Pine Grove had cut the line with little inconvenience to the Reading Company.

LOCOMOTIVES OF THE SCHUYLKILL & SUSQUEHANNA R. R.

<i>S&S Name</i>	<i>P&R No.</i>	<i>Builder</i>	<i>Date</i>	<i>Type</i>	<i>Cyls.</i>	<i>DD</i>	<i>Disposition</i>
Boston	345	P. & R.	1865	4-6-0	18x22	48	To 459
Baltimore	346	P&R Reb.		0-8-0		43	To 1421
Lorberry	347	S&S Reb.					Sc 1881
Susquehanna	348	P&R Reb.		4-4-0			Sc 1881
Schuykill	349	L&C Co.	1843	0-4-0			
		P&R Reb.	1848	4-4-0			
		Sold S&S	1872				Sc 1881
Tremont	350	P. & R.					Sc 1876
Lark	351	P. & R.		4-4-0			Sc 1875
Gold Mine	294	R. Winans		0-8-0			To 1417

The S. & S. engines were taken over by the P. & R. in 1872, except the "Gold Mine," which had been sold to the Reading in June, 1866.

No. 459 was changed to 2nd No. 94, in Sept. 1903, replacing the first No. 94, which was originally No. 6, Catasauqua & Fogelsville R. R.

In 1855, the P. & R. purchased the 25-ton "Pine Grove," a product of Danforth, Cooke & Co., from P. Chonteau, Jr., & Company, the contractors referred to.

Another Kentucky Railroad. The Kentucky & Tennessee Railway. "The Route of the Painted Rocks."

BY ELMER G. SULZER

BOVINE BAGGAGE

Train No. 2, the early morning mixed-run from Yamacraw, had climbed the grade from Comargo and, from the sound it made as it clattered over the yard switches, it bid fair to arrive on time at the Stearns station. M. A. Gibbs, Supt. of the K. & T. Ry., had sauntered over to the station, as was his custom, to greet the train and check its business. Even before the open-platform, wooden cars had come to a stop, the train's human cargo had begun to emerge in quantity that pleased Gibbs. After all, it took a lot of passengers to make the trains a paying proposition. After satisfying himself that he had seen all of the customers, he swung aboard the rear car and worked his way forward, checking the condition of the coaches, seats, and window glass.

Everything was rosy until he entered the combine at the head of the train. Passing through the passenger compartment, he opened the door to the baggage area and, much to his astonishment, in this area was a tethered cow - a very much alive cow.

Choking down his amazement, Gibbs called back the conductor, who, sensing the superintendent's emotions, had started a retreat to the station building. "What's this cow doing in the baggage part of this coach?", was the conventional interpretation of the remarks of the "high brass".

"Well, she's baggage, ain't she?" countered the conductor.

AN INDUSTRIAL PIONEER

The history of the Kentucky & Tennessee Railway is inseparable from the story of Justus S. Stearns, of Ludington, Michigan; a man who made lumber history by extensive operations in Michigan and Wisconsin; in the Pacific Northwest; in Florida; and in Tennessee and Kentucky. Through his energies was founded the Stearns Coal and Lumber Company, Stearns, Kentucky, in 1902; and it has been carried on through son and grandson to the third generation.

The original purchase was 30,000 acres. Through the years, subsequent purchases added additional holdings until the company controlled some two hundred square miles of area. Not all of these lands were in McCreary County, Kentucky, the acreages extending into Scott, Fentress, and Pickett Counties, Tennessee.

As the interests of the company developed, so did the company's army of interested and loyal men, eventually numbering over two thousand—the wage-earners of a larger army of ten thousand men, women, and children. Ramifications of the company included a great

timber and log business in the hills; a huge mill and mill-yard at Hemlock, which for many years was the largest sawmill operating in Kentucky; many large drift coal mines; the modern company-owned headquarters town-Stearns; and a large power plant to provide electricity for all of these activities.

Coincident with the development of the logging business and the coal activities was the company-controlled railroad, the Kentucky & Tennessee; for without a railroad it would have been impossible to bring out the logs from the primitive areas into which roads had not penetrated; coal in quantity could not be moved from the mines; and, indeed, a railroad was needed to provide miners and other employees with some form of transportation.

THE K. & T. RAILROAD AND RAILWAY COMPANIES

On May 22, 1902, the Kentucky & Tennessee *Railroad* was incorporated under the general laws of Kentucky. By May 15, 1903, the 3.5 miles from Stearns to Barthell had been completed and opened to traffic. Coincident with this activity was the development of the first mines by the Stearns Coal and Lumber Company, those at Barthell.

It became apparent before too long that the K. & T., through its articles of incorporation, was not authorized to issue sufficient bonds to provide for the proper expansion of the road. To remedy this situation, the Kentucky & Tennessee *Railway* was incorporated February 8, 1904, with the same incorporators as the previous line, and with the authority to acquire the property, rights, and franchises of the K. & T. Actual conveyance took place by deed dated March 28, of the same year.

Immediately, activity on the construction of the railroad was resumed. By 1906, the line to Yamacraw, 7.5 miles from Stearns, had been completed, and only the building of the bridge across the South Fork held up further work. The bridge, the present concrete arch structure, was finished in 1907, and by the middle of 1908 the track had reached the crossing of Rock Creek beyond Oz. By 1909, White Oak Creek had been tapped, and here the terminus of the K. & T. Railway remained for a number of years.

As the road progressed, new mines were opened, mining towns were established and homes built, and traffic developed for the railroad. The following figures give some idea of the income picture of the railroad for the years 1905 through 1908.

Year	Gross Income	Expenses	Net Income
1905	\$24,551	\$35,662	\$ 7,111*
1906	\$48,918	\$35,808	\$13,110
1907	\$64,724	\$60,037	\$ 4,687
1908	\$64,733	\$70,676	\$ 5,943*

Years given are fiscal ones ending on June 30. Stars (*) indicate deficits.

Passenger service was now being maintained between Stearns and Yamacraw. The railroad was receiving annually from the U. S. Government \$331.32 for carrying the mail between these two points. The

moving of bituminous coal was the big freight item. For the year 1909, the principal classifications of freight carried by the K. & T. Railway were, in tons—

Products of agriculture	1,216
Products of animals	41
Products of mines	203,135
Products of forests	30,847
Manufactures	805
Merchandise	575
Miscellaneous	14
<hr/>	
Total freight tonnage	236,633

It will be noted that, as yet, products of forests were not a dominating item in the business of the railroad. In fact, at this time, active lumbering was confined, for the most part, to the logs hauled from the South Fork to the K. & T. cars, and then transported to Stearns. However, the management of the S. C. & L. Co. was making its plans for the lumbering of the vast acreages held by the company, and a very material extension of the K. & T. tracks up Rock Creek and beyond was in the cards.

Note the "and beyond", for, on February 1st, 1909, the engineering firm of Vandegrift & Company, submitted to the K. & T. management, at its request, a rather detailed report dealing with a proposed extension of the railroad to Chattanooga, Tennessee.

The plan envisaged the continuation of the line from its termination at White Oak on up Rock Creek and into Tennessee. The railroad would pass through a divide from the headwaters of Rock Creek to the headwaters of Laurel Fork, and then follow down the latter stream for twelve miles. The route then led down the ridge dividing the waters of Wolf River, on the west, and Cumberland River, on the east, for a matter of nine miles, to Jamestown.

From Jamestown, the line was to extend southward, following the ridge and passing through Clark Range to the town of Johnson Stand, a distance of thirty-four miles, where the road was to cross and connect with the Tennessee Central Railroad. From here, the railroad would run in a south-westerly direction to Ravenscroft, making a total distance from Stearns of ninety-two miles. At this point a physical connection would have been made with the N. C. & St. L. Ry.

From Ravenscroft, the line was to extend southward through Clifty to the crossing of the Pikeville branch of the N. C. & St. L., three miles north of Dunlap. From here to Dunlap, the road would have paralleled the latter railroad. At Dunlap, the Sequatchie River would have been crossed, then followed for ten and one-half miles to a point on the Southern Railway's proposed new Chattanooga Terminal line near Jasper. From this junction, the track of the Southern Railway would have been used on in to Chattanooga.

THE K. & T. EXPANDS

Needless to say, these grandiose plans failed to reach fruition. However, the future did see the combined tracks of the K. & T. and the Stearns Coal and Lumber Company reach into Tennessee to a point near Jamestown.

Regular passenger service still terminated at Yamacraw in 1910, although the tracks extended almost four miles up Rock Creek by that date. As of March of that year, Nos. 1, 2, 3, and 4 provided daily except Sunday service in the following manner:

No. 3	No. 1	Stations	No. 2	No. 4
2:30 p.m.	5:20 a.m.	lv Stearns ar	7:25 a.m.	6:30 p.m.
3:00	5:40	Barthell	6:55	5:50
3:30	5:55	Worley	5:25	4:20 p.m.
3:45 p.m.	6:00 a.m.	ar Yamacraw lv	5:15 a.m.	

The years 1913-1914, were years of expansion for the Kentucky & Tennessee Railway, during which time the track was extended to a point somewhat over sixteen miles from Stearns. This location, originally known as *Difficulty* was later renamed *Exodus*. Because of an unstable roadbed, passenger service was not provided over the new trackage for a time. By May, 1918, however, complete passenger service was provided over the entire line:

No. 7	No. 5	No. 3	No. 1	Stations	No. 2	No. 4	No. 6	No. 8
2:45 p.m.	3:00 p.m.	5:55 a.m.	5:25 a.m.	lv Stearns ar	8:00 a.m.	4:45 p.m.	5:15 p.m.	5:20 p.m.
3:00	3:15	6:10	5:40	Barthell	7:51	4:30	5:00	5:05
3:10	3:25	6:20	5:50	Worley	7:41	4:20	4:50	4:55
3:16	3:30 p.m.	6:25 a.m.	5:56	Yamacraw	7:35	4:12 p.m.	4:44	4:49
3:26			6:07	Oz	7:23		4:33	4:39
3:34			6:15	White Oak	7:15		4:25	4:31
3:54			6:35	Fidelity	6:55		4:05 p.m.	4:11
4:00 p.m.			6:45 a.m.	ar Exodus lv	6:45 a.m.			4:05 p.m.

All of these trains were scheduled, daily except Sunday, with the exception of Nos. 7 and 8, which ran Sunday only. Nos. 1 and 6 were the "hotshots" of the line, stopping at Barthell, Worley, and Yamacraw only to pickup or discharge passengers from points west of Yamacraw.

More important than this passenger service, however, was the increased freight business developed by the extension. Immense areas of virgin forest had been tapped and the hauling of logs became a vital factor in K. & T. Ry. economics. New coal mines were opened in the vicinity of Trace Branch and Fidelity, and now scores of gondolas and hoppers loaded with the "black diamonds" began to go out over the railroad from these points.

Passenger schedules were again revised in 1919 to provide for two daily except Sunday round-trips between Stearns and Exodus, and one such trip on Sundays. The turnarounds between Yamacraw and Stearns were eliminated.

In 1921, two important additions were made to the K. & T. The main line was extended about three and one-half miles from Exodus to Bell Farm, the latter point marking the final terminus of the railroad.

The extension gave access to important timber areas. The other addition was a branch, slightly more than a mile long, from White Oak (which now became White Oak Junction) to Co-Operative, the site of what was to become the second largest coal operation on the railroad and the source of from twenty-five to forty loaded cars a day when the mine was in full swing.

Still another feeder to the K. & T., perhaps its most important, was constructed around 1925 by the Stearns Coal and Lumber Company. This was a twenty-five-mile logging road, extending on up Rock Creek from Bell Farm, and into Tennessee, to a point northeast of Jamestown. Operated by the S. C. & L. Co. as a private carrier, it poured hundreds of loaded log cars into Bell Farm or White Oak Junction, to be hauled by the K. & T. to the lumber mill at Stearns.

Perhaps the middle and late "twenties" were the heyday of the K. & T. A passenger (mixed train) schedule developed during this period, that endured with minor changes as long as passenger service was provided by the K. & T. over its entire line.

PROSPERITY WANES

As all good things must eventually come to an end, so did the boom on the Kentucky & Tennessee. In 1935, passenger service between Bell Farm and Exodus was discontinued. Around the first of 1939, all scheduled passenger trains between White Oak Junction and Exodus were cancelled. Thereafter, the service consisted of two daily except Sunday round-trips between Stearns and Co-Operative, leaving the former point at 5:35 a.m. and 11:00 a.m., arriving at Co-Operative at 6:30 a.m. and 11:57 a.m.; and leaving the latter station at 6:35 a.m. and 3:45 p.m. reaching Stearns at 7:34 a.m. and 4:54 p.m.

In 1937, the mine at Fidelity closed and, by 1938, practically all coal traffic between White Oak Junction and Bell Farm had ceased, with the exception of Mine 15, just south of the junction. Symbolic of the declining timber resources was the fact that, in 1937, the Stearns Company deeded 47,000 acres of land to the Cumberland National Forest.

Two bright spots, one of a very temporary nature, served to bolster the K. & T. traffic during this period. A rather short-lived oil field developed in the area between White Oak Junction and Co-Operative, and for a time sizable quantities of oil were loaded at the junction and hauled out in tank cars.

Of a more permanent nature was the opening of the coal mine No. 18, at Blue Heron, and the building of the mile of track from the junction at Comargo, to the new operation. This development occurred in 1937-38, and resulted in the most modern and up-to-date mine of the Stearns properties. While passenger service has never been scheduled regularly over the one-mile branch, the coal business resulting from the mine has been a life saver to the railroad in recent years.

SOME SPIKES ARE PULLED

As the areas of merchantable timber became worked out, the log trains became fewer and fewer. Finally, in 1948, the logging road

owned and operated by the Stearns Coal and Lumber Company between Bell Farm and a point near Jamestown, Tennessee, was abandoned and taken up. As a result, the log traffic from the vicinity of Bell Farm practically ceased overnight. At about the same time, a highway was completed to Bell Farm which further served to diminish the importance of the railroad.

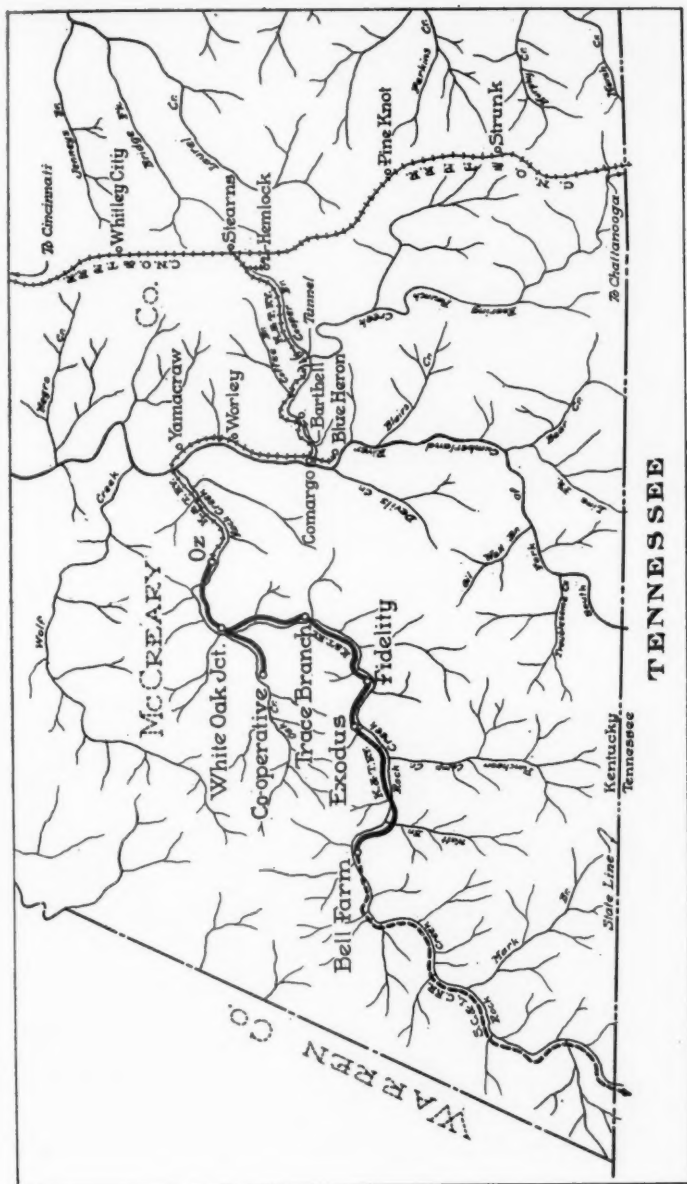
It was not surprising, therefore, that on December 13, 1948, the Kentucky & Tennessee Railway applied to the Interstate Commerce Commission for permission to abandon the 8.32 miles of main track between White Oak Junction and the end of the line at Bell Farm. It was pointed out in the petition that rail operations had been discontinued on the segment with the exception of one or two trips a week to serve a wagon mine at Exodus. During each of the two years, 1946-47 and the first ten months of 1948, carload freight on the segment amounted to 1,641, 1,527, and 1,427 carloads, of which 1,480, 1,408, and 1,325 cars were logs, 122, 78, and 36 cars were coal, and the remaining miscellaneous items. The system revenues for operation of the line for the periods stated were, \$7,647, \$8,403, and \$8,686; and the cost of roadway and track maintenance alone was \$8,299, \$13,057, and \$6,192, all respectively.

Permission to abandon the White Oak Junction—Bell Farm segment was granted March 3, 1949, effective thirty days later. All operations on this section of track were promptly discontinued with the exception of that needed to service Mine 15, and this mine was shortly closed, thus eliminating the necessity for any operation on the branch, whatsoever. Nevertheless, the track and other appurtenances were allowed to remain in place for a considerable period before they were removed, in March, 1953.

A major blow was dealt the K. & T. in 1950, when the huge mining operation at Co-Operative closed due to a gradually sickening coal industry and the inability to maintain the mine on a paying basis. As a result, traffic practically evaporated as far as the Oz-Co-Operative section of the railroad was concerned. Passenger service was cut back to Worley and operated daily with the exception of Saturdays and Sundays.

This schedule lasted for less than two years, for, on January 1, 1952, all passenger service on the K. & T. was discontinued. Meanwhile, the difficulties in respect to the coal business multiplied. In 1951, the Blue Heron mine went on a standby basis; late in 1953, mines at Worley and Yamacraw closed; and, in December, 1953, the mine at Oz was shut down by a strike.

Although the Co-Operative mine had ceased production in 1950, it was not until 1953 that decision was made to permanently close the operation. As a corollary to this decision, a request was made on October 1, 1953, to the I. C. C., to abandon the 2.41 miles of track between Oz and Co-Operative. The application stated that no traffic had been handled on the line since April, 1953, with the exception of a few cars of scrap iron from the Co-Operative mine, which was being dismantled at that time.

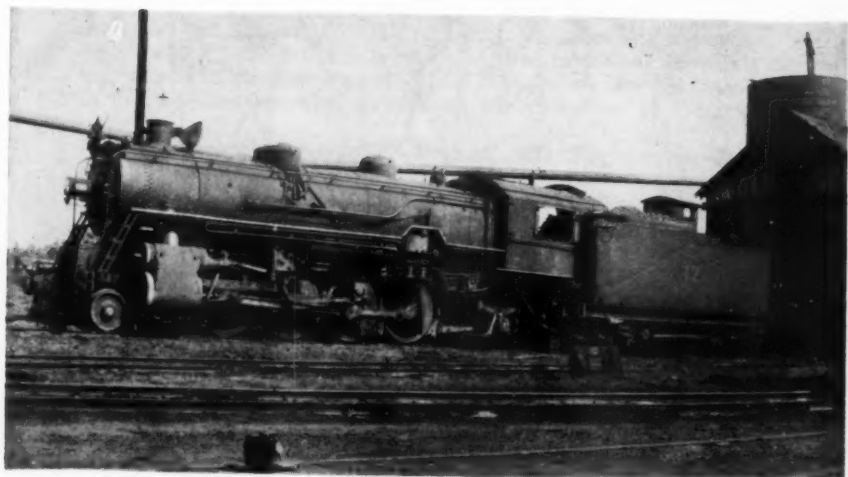


Map of Kentucky & Tennessee Ry.



K & T No. 1. Schenectady, 1903.

Courtesy of S. P. Guthrie.



K & T #12, Baldwin, 1911. Ex Southern Ry. #4501.

Courtesy of S. P. Guthrie.



Courtesy of S. P. Guthrie.

K & T Passenger Coach at Co-Operative, Dec. 11, 1947.



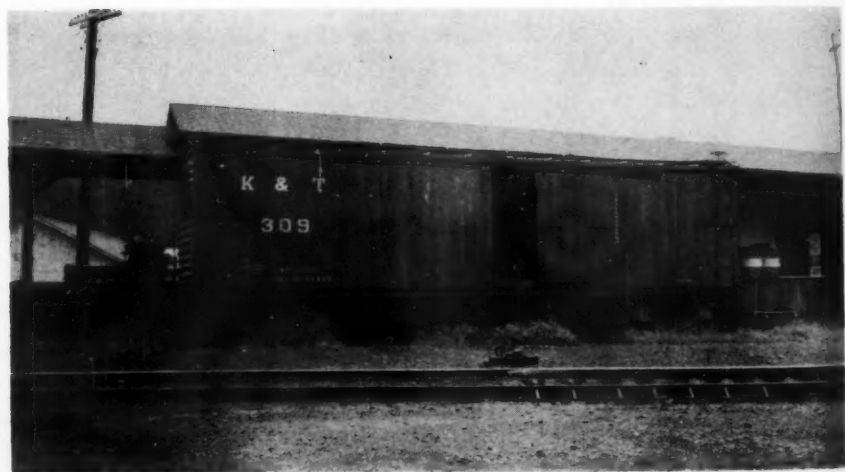
Courtesy of S. P. Guthrie.

Log cars on Bell Farm Branch.



Courtesy of S. P. Guthrie.

Home made gondola No. 80 at Stearns, Ky. Aug. 1952.



K & T Box car #309.



Courtesy of S. P. Guthrie.

K & T log car (work car) No. 65.



Courtesy of S. P. Guthrie.

K & T Ry. Bridge over South Fork. Looking east from north side.



Courtesy of S. P. Guthrie.

Loading tippie at Co-Operative, looking west.

KENTUCKY & TENNESSEE RAILWAY. "ROUTE OF THE PAINTED ROCKS."

J. S. STEARNS, Prest., Ludington, Mich.	J. E. BUTLER, Gen. Mgr., Stearns, Ky.
W. T. CULVER, 1st V. P., Stearns, Ky.	L. C. BRUCK, Traf. Mgr., "
E. F. BARTHELL, 2d Vice Prest.,	H. C. TRENT, Auditor, "
208 So. La Salle St., Chicago, Ill.	R. W. HENDERSON, Purch. Agt., "
R. L. STEARNS, Sec'y Stearns, Ky.	EDD WINCHESTER, Chief Train
W. A. SPENCER, Treasurer, "	Dispatcher, Stearns, Ky.

		5	3	1	Mis	May 12, 1928.		2	4	6		
		P M	A M	A M	LEAVE	[ARRIVE	A M	P M	P M		
Connection. — 1 With Southern Ry. System.	\$200	1100	15	35	0	⊙..... Stearns ¹		8 22	5 04	4 44	§ Sunday only; / flag stop. ⊙ Telephone stations. STANDARD — Cent. time.	
	—	—	—	—	—	⊙..... Hemlock		—	—	—		
	2 15	11 15	5 50	4	—	⊙..... Barthell		8 07	4 48	4 29		
	2 19	11 19	5 54	5	—	⊙..... Comargo		8 01	4 43	4 23		
	2 25	11 25	6 00	7	—	⊙..... Worley		7 53	4 54	4 17		
	2 31	11 31	6 06	8	—	⊙..... Yamacraw		7 47	4 29	4 12		
	2 41	11 41	6 15	10.5	—	⊙..... Oz		7 38	4 20	4 03		
	2 47	11 47	6 21	12	—	..... White Oak Junction.		7 32	4 14	3 57	
	—	—	—	—	—	..... Trace Branch		—	—	—	
	3 01	12 01	6 35	16	—	..... Fidelity		7 18	4 00	3 43	
3 04	12 04	6 38	17	— Exodus		7 15	3 15	3 40			
—	—	—	—	— Gregory		—	—	—			
3 16	12 18	6 52	20	arr....	Bell Farm	lve.	17 00	13 00	13 25			

WHITE OAK BRANCH—White Oak Junction to Cooperative (1 mile).
Operated for freight traffic only.

KENTUCKY & TENNESSEE RAILWAY

1946-1947

No. SX 120

PASS -- Mr. Sam Snicklehopper --
ACCOUNT NEWS BUTCH - K&T.
Stearns and Bell Farm, Ky.

BETWEEN ALL STATIONS

UNTIL DECEMBER 31st, 1947 { UNLESS OTHERWISE ORDERED AND
SUBJECT TO CONDITIONS ON BACK

VALID ONLY WHEN COUNTERSIGNED BY MYSELF OR L. C. BRUCE

COUNTERSIGNED BY

L. C. Bruce

J. P. Guthrie
Pres. & Gen'l Mgr.

A K & T pass for the "News Butch."



Courtesy of S. P. Guthrie.

Co-Operative. Looking West.



Courtesy of S. P. Guthrie.

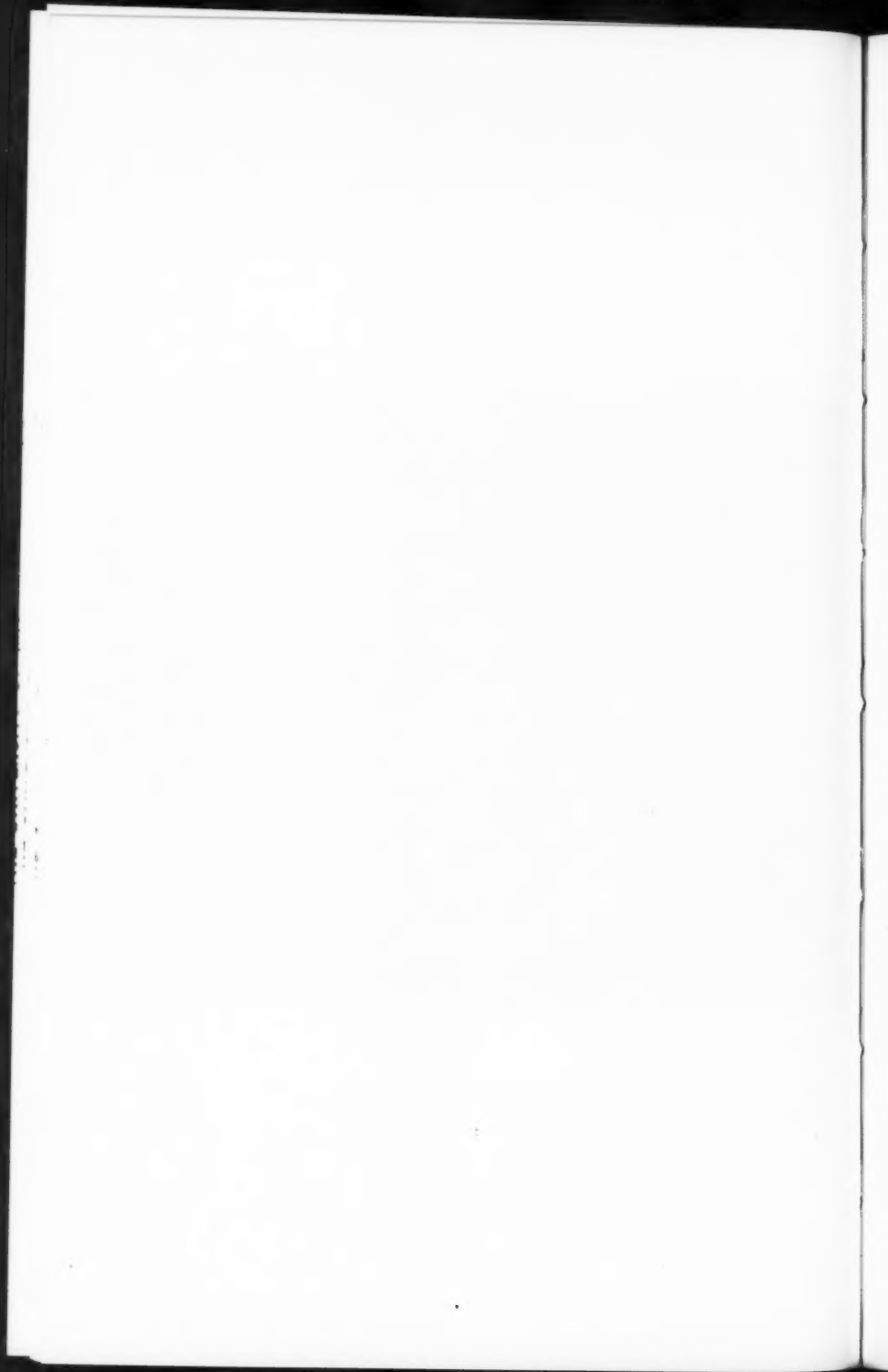
K & T Ry. Looking across North Fork Bridge.

Guthrie.



K & T Ry. West of Yamacraw.

Courtesy of S. P. Guthrie.



Permission to abandon the line was granted by the I. C. C. on November 23, 1953, effective thirty days later. The physical retirement of the Oz-Co-Operative segment was held up by the K. & T. officials until it was definitely determined that no more coal was to be mined in that region.

THE K. & T. TODAY

As of November, 1959, the *Official Guide* stated that the K. & T. Railway consisted of 11.5 miles of main track, operating as follows:—Stearns to Worley, 6 miles; Comargo to Blue Heron, 1 mile; Worley to Oz, 4.5 miles. There are also 9.60 miles of yard tracks and sidings. Company records state 12.92 miles of main track. In addition to work equipment, the road owns three 2-8-2 type locomotives and nineteen freight cars. The engines have had new flues recently and are being maintained in good condition. Apparently steam will be with the K. & T. for a few years hence.

Much of the coal originating on the road today comes from stripping operations, although Mine 16, at Oz, and Mine 18, at Blue Heron, are producing good tonnages and are profitable. The labor situation is currently favorable to the changed conditions. At Stearns, the old band mill has been closed and dismantled. A new sorting and trimming mill has been erected, and lumber is purchased and processed in connection with the old established planing mill. Obviously, the lumber operations are a going concern again.

COAL, TIMBER AND HUMANS

In that order, these commodities constituted the chief business of the K. & T. Railway. Let's take a look at the operating methods used by this line to take care of these items.

Originally, the rulebook of the Queen & Crescent Railway, the forerunner of the C. N. O. & T. P. Ry., constituted the basic operating "bible" of the K. & T. Later, the Standard Code of Rules, published by the Association of American Railroads, was substituted. Supplementing the rulebook was a booklet of special rules issued at irregular intervals, and pertaining specifically to the K. & T. Operating time-tables, consisting of a single mimeographed sheet were issued as a rule twice a year. Train orders were put out by the dispatcher who was located in the Southern Railway station at Stearns.

Until passenger service was discontinued in the early part of 1952, the scheduled service consisted of four mixed trains, of which Nos. 1 and 3 were westbound, and Nos. 2 and 4 were eastbound. These trains included the necessary coach equipment, plus as many freight cars as the locomotive could handle and business dictated. When freight cars in excess of this number had to be moved, extras were created, and these extras had to clear the time of opposing trains by not less than five minutes unless otherwise authorized by train order.

In the early days of passenger service, wyes were in use at Stearns and Exodus for passenger trains only. When these wyes were discon-

tinued, the practice was adopted for all locomotives to operate with headend east (towards Stearns) regardless of the direction in which they were moving. However, the locomotives were placed generally at the front end of their trains.

For a time it was required that all loads be pushed and not pulled up the Comargo to Stearns hill. Later this rule was changed to permit loads to be pulled, providing certain precautions were taken.

During the lush days of the passenger business, all three coaches and the combine were included in the trains. On some occasions one of the coaches would be dropped at Yamacraw by the westbound trains, to be picked up by the return movement. In later years, a single coach and combine were adequate to take care of the traffic. Since only a single set of passenger equipment was on the line at any one time, No. 1 was made superior to No. 2, No. 2 to No. 3, and No. 3 to No. 4. Thus excessive train orders were obviated when one of the scheduled trains was so late as to be on the time of another.

Log trains coming off the line of the Stearns Coal and Lumber Company were either set out at Bell Farm to be picked up by No. 2, No. 4 or an extra on the K. & T., or were hauled by the S. C. & L. C. locomotives to White Oak Junction, to be picked up by the K. & T. at that point. At one time all passenger cars were handled at the rear of westbound mixed trains, and immediately behind the engine on eastbound trains. Later, this requirement was dropped.

The log loader was prohibited from being in the consist of a train carrying passengers, and explosives could not be carried in mixed trains, except over that part of the K. & T. having no regular freight service.

One operating rule may conceivably have proved rather irksome to passenger patrons at times. This was the rule reading "Coal being the principal commodity handled by the K. & T. Ry., and the source of revenue, train conductors should make a special effort to keep the mines running. When passing a mine in trouble either by a derailed car, dumped car, being blocked off with loads, or out of empties, they should stop, and relieve them if possible, without special orders to do so."

We can readily picture the thoughts of the coach customers, waiting impatiently at a mine, while the train crew was laboriously re-railing a gondola, or shoveling up the mess caused by a dumped car.

To protect operations on the hill, and especially to prevent "corn-field meets," the order board at Barthell station was kept in stop position at all times except when the office was closed. Westbound trains were prohibited from passing the station until the engineers saw the board change from stop to clear position, or from red to white. Eastbound trains could not pass this point until they obtained a clearance form which permitted such trains to proceed to Stearns in the event that there were no orders. The order board remained in stop position for eastbound trains. As an additional precaution in the hill operation, trains were required to use twelve minutes in running time from Stearns to Barthell. Freight and mixed trains departing from Stearns yard had to have retainers turned up on 50% of all cars.

In spite of all of these safety measures, however, runaways on the hill did occur, sometimes with humorous results. There was the time that engineer Charlie Porter started down the grade with a string of empty logging flat cars. Some thirty or forty workmen were dead-heading a ride on the train and were scattered over many of the cars, sitting or standing.

The train hadn't gone far, when the discovery was made that it was practically without brakes. Charlie got by fairly well by using the engine brake alone, until the train got close to the curve just east of the tunnel. Here, the speed reached a point where it could not be checked. Panic spread among the crew and the deadheading passengers. As rapidly as possible they unloaded, preferring a few bruises to taking a chance and riding the runaway down the hill.

That is, all unloaded except one courageous fellow sitting on the rear of the tender. The locomotive had been running backwards down the hill, thus putting this rider at the headend. He stuck to his post while the train was steadily gathering speed. At last it reached the section of level track at Barthell and here it came to a gentle stop. The passenger on the front end of the tender calmly stepped down.

Only then was it discovered why this gentleman had so much stamina as to remain on the train. He had a wooden leg and couldn't jump!

At White Oak Junction, a signal block light for west bound trains was maintained. When this light showed red, the line to Bell Farm was occupied; if the light was dark, the line was clear. This signal was operated by the station agent at the junction.

A speed limit across all bridges on the railroad was set at ten miles per hour; and the limit across the track scale at Stearns was five miles per hour.

AMONG THE "PAINTED ROCKS"

For a short line railroad, the Kentucky & Tennessee was built to commendable standards. Laid with rail mainly of 80-lb. to 90-lb. section, oak ties were used throughout, averaging 2,840 per mile. Part of the ballast was broken stone, and the remainder was composed of miscellaneous materials secured along the route of the railroad. Grading was heavy, averaging 31,000 cubic yards per mile, of which 40% was in loose rock, and 48% in solid rock. Due to the rough character of the country, curves were numerous. Many of them were quite sharp ranging to 22° in curvature.

From a scenic point of view, the K. & T. had no peers, at least in Kentucky. The vistas along the South Fork, as well as in the valley of Rock Creek, were Kentucky mountain grandeur at its best; and more's the pity that during the time that the railroad maintained passenger service, few persons outside of local residents ever availed themselves of the privilege of a trip over the line. The vivid and distinctive colorations that nature had bestowed upon the huge boulders to be found in the valleys gave the K. & T. its motto—"The Route of the Painted Rocks."

The K. & T. joined the main line of the Southern Railway at Stearns, with a connection by which trains of the former line would be headed north when entering Southern tracks. Shortly after leaving the junction with the Southern, a spur off the K. & T. led to the immense mill and shops of the railroad and the Stearns Coal and Lumber Company. This point was named "Hemlock," after the immense quantities of wood of that type milled there. Here was located a large machine shop in which heavy repairs were made on the K. & T. rolling stock, as well as on the mine machinery and cars as needed. At Hemlock were the railroad storeroom, car repair tracks, yards, and other facilities of the usual railroad terminal.

Almost immediately beyond the junction with the spur to Hemlock, the main line of the K. & T. commenced its five-mile descent along the north side of Cooper Branch at a grade of 2.7%. This was the ruling grade of the railroad.

About half-way down this grade was the only tunnel on the line, an unlined bore 265 ft. long. At the four-mile point was Barthell, the location of Mines 1 and 2. Here the descent of the track was halted for a short distance by a segment that was laid out at almost dead level. Following this stretch, the descent was resumed until the valley of the South Fork of the Cumberland River was reached. Here were Comargo and the location of the junction of the one-mile spur to Blue Herron (Mine 18). This spur joined the main track in a "down-river" fashion, so that a train, heading out from Stearns, would have to back up from Comargo to Blue Herron.

The total descent from Stearns to Comargo was approximately 450 ft. accomplished in a matter of four and one-half miles.

From Comargo, the K. & T. pursued a two-mile course down the South Fork to Yamacraw. Just a short distance down river from Comargo were a passing siding and a system of storage tracks, known as East Bridge One. One mile from Comargo were Worley and Mines 3 and 4. At Yamacraw was No. 10 Mine. Here the tracks of the railroad crossed the South Fork by a magnificent concrete arch bridge 575 feet long and including five 100-ft. spans. At the time of its construction in 1907 it was the largest reinforced concrete bridge in the south.

From this bridge the line ascended the valley of Rock Creek the remainder of the distance. Two and one-half miles from the bridge was Oz, the seat of Mines 5, 6, 7, 8, 9, and 11. Nos. 5 and 9 were reached by spurs running some distance from the main track. More recently, Mine 16 was also located at Oz and it is one of the two mines producing today along the line of the K. & T.

The tracks along the South Fork were laid at a very gentle grade, often approaching level. Along Rock Creek, however, there was a continuous rise averaging .27%. Point Cliff Mine No. 17, was located about three-quarters of a mile up-stream from Oz, and then three-quarters of a mile further on was White Oak Junction. This was the point where the one-and-one-half-mile branch diverged to the right to reach Co-Operative, the location of one of the largest of the mining operations.

The main track swung to the south at White Oak Junction, reaching Mine 15 within three-quarters of a mile. Trace Branch station was two miles from the junction, and Fidelity with another mining operation, was four miles from the same point. One mile up the creek from Fidelity was Exodus, and three miles further on—twenty miles from Stearns—was Bell Farm, the end of the Kentucky & Tennessee Railway. From Bell Farm, the lumber trackage of the Stearns Coal and Lumber Company followed Rock Creek into Tennessee to a point northeast of Jamestown, for a distance of approximately twenty-five miles.

In summary, stations on the K. & T. with mileages from Stearns (approximate in some instances), were as follows:

0.00 Stearns
0.50 Hemlock
3.50 Barthell
4.50 Comargo
5.50 Blue Herron
6.50 Worley
7.50 Yamacraw
10.00 Oz
11.36 White Oak Junction
12.41 Co-Operative
13.32 Trace Branch
15.30 Fidelity
16.27 Exodus
19.68 Bell Farm

The Southern Railway passenger-freight station at Stearns also served the K. & T. Other station structures were to be found at Comargo, White Oak Junction, Co-Operative, Trace Branch, Fidelity, Exodus, and Bell Farm. Some of these were actually company stores in which the railroad business was simply one of the activities. Section houses were at Hemlock, White Oak Junction, and Exodus. Water tanks were to be found at Hemlock, west of Worley, between Yamacraw and Oz, and Exodus. Coaling stations were at Barthell and Worley.

Besides the usual mine storage and tippie tracks, passing sidings were to be found at Comargo and a point just south of White Oak Junction. The entire railroad was paralleled by a two-wire dispatcher's circuit, tapped by phone booths at most stations to enable trainmen to call in for orders. Train order offices were located at Barthell, Worley, Yamacraw, and White Oak Junction.

Assistance in the preparation of the account of the Kentucky & Tennessee Railway abandonments was furnished by L. C. Bruce, vice-president and traffic manager of the K. & T., Mrs. Bruce, M. M. Schick, Rube Cox, Joe Creason, Charles E. Fisher, John E. Butler, and the Louisville *Courier-Journal*.

Many rare photographs covering both the A-J and the K. & T. abandonments were generously furnished by S. P. Guthrie. The excellent map work, as usual, was by John S. Horine.

STEAM HOGS AND OTHER "STOCK"

When the first locomotive for the K. & T. was secured, it was heavier and more powerful than any of the "iron horses" in use on adjacent portions of the Southern Railway, and when it was moved in, it was necessary to take off some of its heavy parts and load them on flat cars so as to distribute the weight on the Southern's main-line bridges prior to delivery at Stearns. In addition to the locomotives of the K. & T., the Stearns Coal and Lumber Company directly owned two Heislars bearing numbers 112 and 113. The twelve locomotives owned by the K. & T. are shown herewith.

No.	Builder	C/N	Date	Type	Cyls.	DD	Remarks
1	Schenectady	27409	1903	2-8-0	22x26	51"	Built as Stearns Lbr. Co. first #1. Wt. 84 tons. Westinghouse Air Brake. American Steam Brake.
2	Lima	874	1904	Shay	10x12	29½"	Sold to Georgia Car & Lbr. Co. Became Grasse River Ry. #6.
3	Lima	1530	1905	Shay	11x12	29½"	Built as Stearns Lbr. Co. #3. 45 tons. To Raleigh Lbr. Co., Glen Morgan, W. Va. To Smokey Mt. Ry. #1, Ashville, N. C. To W. M. Ritter Lbr. Co. #5, New River, Tenn.
4	Lima	1906	1907	Shay	10x10	28"	Built as Stearns Lbr. Co. #1. (2nd) 45 tons. To Navarro Lbr. Co., Calif. In 1921, Albion Lbr. Co. Albion, Cal.
5	Porter			0-4-0T			35 tons. Saddle tank. Air brakes.
6	Baldwin			0-6-0T			35 tons. Saddle tank. Air brakes.
7	Baldwin	32763	1908	2-8-2	21x24	44"	91 tons. W. A. B. American Steam Brake.
8	Baldwin	37269	1911	2-6-2	20x24	51"	Bought new.
9	ALCo			2-6-0			60 tons.
10	Baldwin	53182	1920	2-8-2	21x24	56"	Bought new. Wt. 130 tons.
11	Brooks	63271	1922	2-8-2	25x30	56"	Bought new.
12	Baldwin	37085	1911	2-8-2	27x30	63"	Ex-Southern Ry. #4501.

For a short-line railroad, the K. & T. was always unusually well supplied with rolling stock, which, in 1909, included 3 box cars, 9 coal cars, 8 log cars, 20 flats, 4 gravel cars and 2 cabooses. This number grew by leaps and bounds until, on July 1, 1945, the rolling stock roster was lined up in this fashion.

Service or kind

Oil tank flat—used on log road
Gondolas
Cap Board—used in mines
Water Car
Log Cars

Numbers.

4, 6, 8, 14, 201-202, 204-205, 207, 209-211.
35, 55.
54.
25-26, 28-29, 31-34, 39-41, 43-53, 56-61,
63-66, 68-75, 77, 79.

Combination coach	104.
Passenger coaches	106-110.
Hoppers	213-215.
Ash Cars	216-217.
Box cars	304-311.
Dump cars	450-457.
Spreader	452.

The reader may use his own judgment in assuming the existence of cars for which numerical gaps are shown. Note that number 452 is given to both a dump car and a spreader. The four pieces of passenger equipment were of wooden, open-platform construction, heated with stoves, and painted dark green.

A RUTLAND R. R. ANECDOTE

This is a true story of an incident on the Rutland Railroad and was related to member Fred H. Welling by a former Rutland engineer. Years ago it was the practice to place the engine of the Bennington Branch passenger train, when it arrived at North Bennington, on the so-called White Creek track, south of the station, and hold it there in readiness to push the north-bound "Sleeper," (Train No. 51), from North Bennington to the top of the grade at the yard limits, if the "Sleeper's" train exceeded a certain number of cars.

The engine of this tale was a Taunton (locally pronounced Ta'nton) mogul and, on the night in question, was duly settled on the White Creek track. During the long interval of waiting for the Sleeper, the crew dozed in the cab, and the mogul's steam pressure dropped well below the point of usefulness, let alone efficiency. In due time the north-bound train arrived and the helper engine made its way, though somewhat feebly, to the rear end of the train, to which it was coupled. The train started on its northward journey without waiting for the pusher's boiler pressure to build up, and, at the yard limits, where the mogul was to have been cut loose from the train it was supposedly pushing, it was actually being pulled along, down grade, by the engine on the head-end, and could not be uncoupled because of the tension of the couplers.

In this humiliating predicament the Ta'nton mogul was dragged along until the Sleeper reached the next scheduled stop at Arlington, where the red-faced crew finally cut her loose and returned to North Bennington, never to hear the last of their pushing No. 51 downhill to Arlington.

F. S. G.

The Parlor and Sleeping Cars of The New Haven

By CHARLES E. FISHER

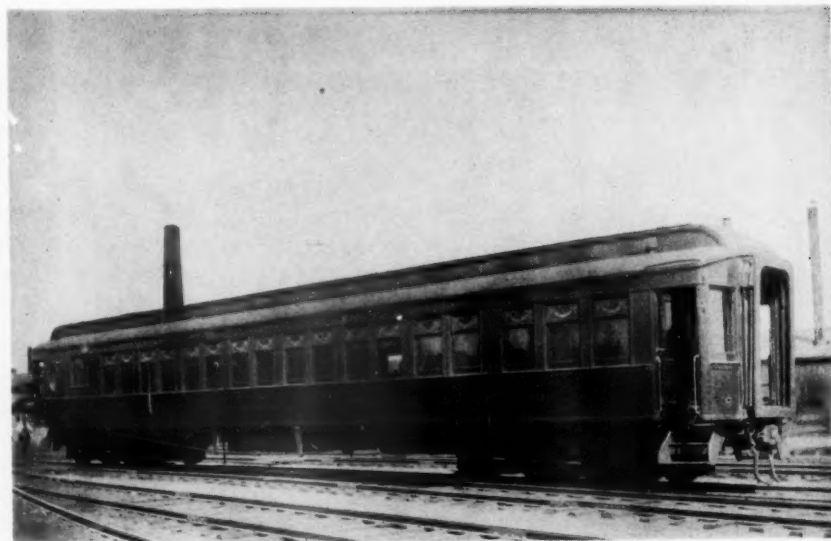
It may come as a surprise to many of our members that the New Haven was one of the few railroads in this country that owned and operated their own sleeping and parlor cars. It should also be stated in this connection that this road, for years, was also one of the few railroads whose earnings from passenger traffic exceeded those from freight, forming about 55% of their revenue. One might well ponder what the present method of cost allocation prescribed by the I. C. C. would do to this percentage, yet at this time, the New Haven was one of the best money earning railroads in the country.

Your writer admits that he never rode in a parlor car between Taunton and Boston. Altho' the additional fare was only 25c, father was not going to squander his money that way. The coaches were good enough for that 36 mile ride. There were two parlor cars that were used all the year round on the "Boat Train." In the summer months, a parlor car was added to the "Dandy" between Boston and Newport and later, one was added to the New Bedford section and, when the "Whaler" was inaugurated, was assigned to that train. All of these cars were of the narrow, vestibuled type, they were the older cars and the upholstery was a robin's egg blue shade. The 8:50 A. M. express train from Boston also carried a parlor car in the summer months for Newport. This was one of the older cars, with open platforms, large windows with white shades. Since the rest of the train was made up with open platform coaches, this parlor car conformed with the rest of the train. The summer months saw parlor cars added to the trains that ran down to Cape Cod from Boston, there was no service from New York in those days and to the Berkshire Hills from New York.

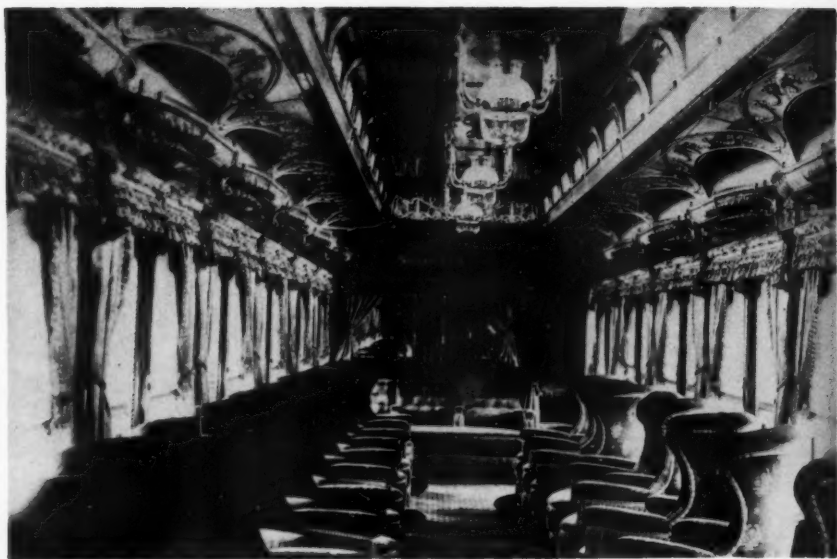
As might be expected, most of these cars were used between New York and Boston. In 1912 there were three five hour trains between those cities on which an extra fare was charged—the "Bay State", "Knickerbocker" and "Merchants' Limiteds" leaving either terminal at 10 A. M. and 1:00 and 5:00 P. M. respectively. They were followed by a six hour train leaving a few minutes after the departure of the limiteds. Father always felt the extra fare on the limiteds was robbery—five hours for the 233 miles was nothing to brag of, the running time should be speeded up anyway and for these and many more reasons, we always rode the six hour trains. However, somewhere around 1910, the road added an express train between Taunton and Providence—the train making only four stops instead of the usual ten—connections at Providence guaranteed. Thus, one could leave New York at 1:00 P. M. on the "Knickerbocker", enjoy one of the New Haven's dollar dinners and they are only a memory now, change cars at Providence and arrive home in ample time for supper—the dollar extra fare on the "Knicker-



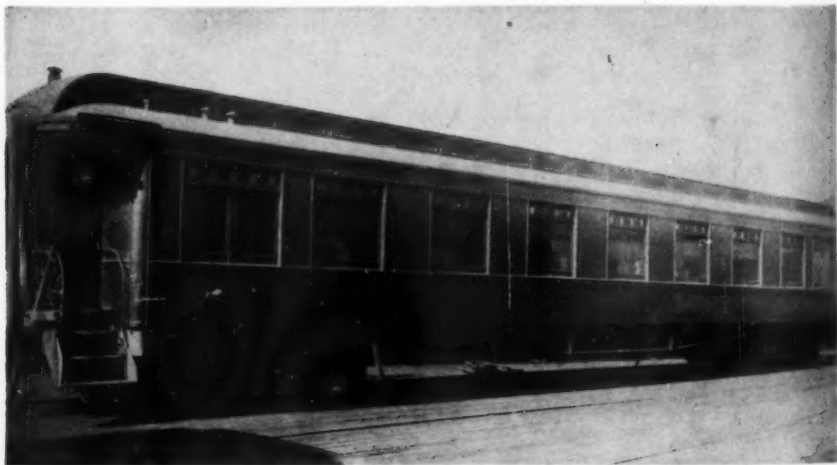
N. H. Sleeper #2009. New Haven Shops ———.



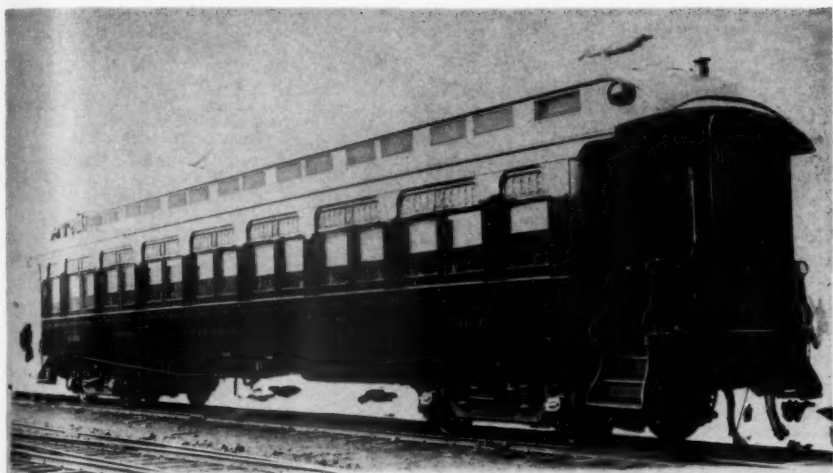
N. H. Sleeper #2018. Barney & Smith 1893.



N. H. Parlor Car #2129. Interior view showing seats at each end of car. New Haven Shops 1887.



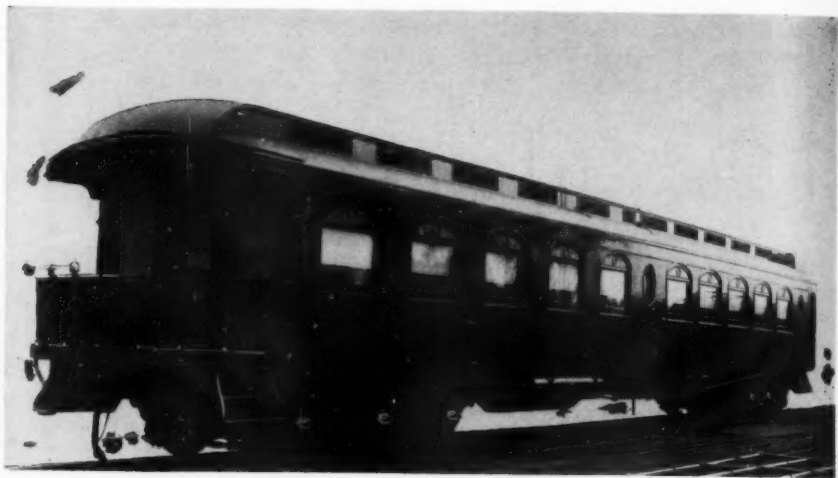
N. H. Parlor Car #2157. Barney & Smith 1893.



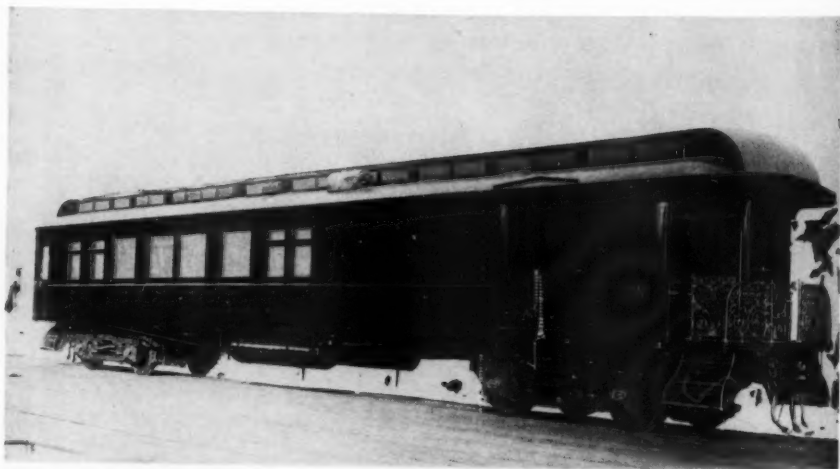
N. H. Parlor Car #2163. Pullman 1891.



N. H. Parlor Car #2169. Jackson & Sharp 1893. One of the Allen "Hotel" cars.



N. H. Parlor Car #2178. Pullman 1900.



N. H. Buffet Smoker #2259. Barney & Smith 1893. "New York" and "Boston" appear between the door and windows.

bocker" was a wise "investment" and became our favorite return journey. These trains ran weekdays only.

I can't vouch for the other five hour trains but the make-up followed the usual New Haven pattern of the period. The first car behind the locomotive carried a limited amount of baggage but the passenger section was a parlor car. Since it was the first car behind the locomotive, it was inclined to be a bit rough riding and many people did not care for it for that reason. The following parlor cars were upholstered in a shade of light green and the cars had the lavatories and washrooms at each end and on each side—lavatory on one side, washroom on the other. The last car of the train was an observation club car. These three limited trains had the best in the way of equipment. The "Bay State" and "Knickerbocker Limiteds" were used by families and some of the cars on these trains had compartments or drawing rooms. The "Merchants" which was a businessman's train did not have them until later years.

The older equipment was assigned the six hour trains. I recall one return trip from New York in one of the cars assigned these trains. Generally one of the parlor cars would have a large smoking room with the lavatories and washrooms in their usual location. Against the partition of the smoking room or lavatory were placed three seats, side by side and altho' these would not always be sold, when traffic was heavy the space was used. Three would be in the direction of travel and, on the other three one would ride backwards. Father got stuck with two of these seats one time but was fortunately able to exchange them for others after leaving New Haven.

The six hour trains over the Shore Line were not the only six hour trains between Boston and New York. The Boston & Albany R. R. joined with the New Haven at Springfield, Massachusetts in the handling of three six hour day trains and one night train between these two cities. Leaving either terminal one hour in advance of the five hour trains, their arrival either coincided with or preceded that of these trains and the "Twilight Express", leaving at 4:00 P. M. was a very popular and well patronized train. Much of the equipment of these trains was furnished by the New Haven. There were also two trains in each direction, leaving at 8:00 A. M. and 2:00 P. M. routed via Willimantic and Waterbury that also made the run in six hours. In the spring and fall of the year, this was one of the prettiest rides in this section. The "Colonial" and "Federal Express" trains between Boston and Washington carried Pullman equipment. For years, the first train over the Shore Line was the "Bay State" leaving either terminal at 10:00 A. M. and arriving at 3:00 P. M. and, unless you left on the 8:00 A. M. via Waterbury, that was the earliest you could arrive in either city unless you used one of the night trains.

Probably the night trains between Boston and New York had as many innovations in the matter of passenger equipment as any route in the country. In 1893, Messrs. Jackson & Sharp of Wilmington, Delaware built four Hotel Cars named "Plymouth", "Priscilla", "Puritan" and "Pilgrim" on designs that originated with Mr. E. G. Allen, Sup't.

of the Old Colony R. R. The cars carried the same names as four of the steamers on the Fall River Line. These "Allen Hotel Cars" were all staterooms. Instead of being all on one side they were placed alternately on each side. Each stateroom had an extra wide upper and lower berth, a wash stand, toilet and foot bath tub. The kitchen was in the middle of the car and each car was mounted on six wheel trucks. Upon completion, they were placed in Boston-Chicago service via the Fitchburg and connecting railroads because of the Chicago Fair. The New Haven R. R. evidently purchased these cars for, in 1895 one car was carried on each of the four midnight trains between Boston and New York. We can only assume that the twisting aisle around each stateroom was a detriment and the kitchen was unnecessary—at any rate, the road rebuilt all of these hotel cars to parlor cars, numbered them 2166-2169, one of which is illustrated. Even so, they weighed 101,900 lbs.

Probably the "Owl" leaving either city at 1:00 A. M. and making the run in six hours and five minutes, with only one stop at New Haven to change locomotives, was one of the most comfortable and luxurious night trains, with more innovations than any train in this country. I don't know if the "Allen Hotel Cars" were ever called the "Zig Zag" cars but not long after the turn of the century the New Haven introduced two cars—Nos. 2025-2026, with a stateroom and berth opposite. These berths were half width and on alternate sides the berth was enclosed in a small room with a washstand but no toilet. Each car had eight compartments and eight single berths. The aisle, instead of being straight, was a series of turns to the left or right as one passed between berth or room, hence the name. There was nothing above the berth in either room or car and the room sold for the price of a lower and the berth sold for the price of an upper. These cars were sold out every night.

Each "Owl" carried a "Brass Bed" car, Nos. 2056-2057. These cars were placed in service about 1910 and, according to the June, 1912 timetable—"Each car contains seven superbly finished apartments. You have the luxury of a private room in a private car. Full-length brass bed and all toilet conveniences in each apartment. The charge is \$12.00 for occupancy between Boston and New York by one person. This includes one way fare between these points. If occupied by two persons, an additional charge of \$4.75 is made." Again, these cars were always sold out.

Another car carried on this train was a "Buffet Stateroom Baggage Car." These cars had a large baggage compartment next to the locomotive tender and the balance had staterooms and a small kitchen for a "midnight snack" or early breakfast. Cars 2262-2263 had a capacity for 20 passengers and Nos. 2264-2265 carried only ten. The latter two had four drawing rooms and the former two probably had twice that number. The "Midnight Express", leaving at 12:01 A. M., made the trip in a little less than seven hours, carried regular sleeping cars and coaches with cars to Providence, R. I. all the year round and to Narragansett Pier during the summer months. The "Owl" carried

regular sleeping cars also. All of these "innovations" disappeared when the road sold out their parlor and sleeping cars to the Pullman Company but, it would seem to this observer that such "innovations" that would fill these cars every night to capacity would merit consideration despite they differed in Pullman standards. The "standards" could be improved in many instances.

Club cars were carried on the 3:00 P. M. train later known as the "Puritan" and on the "Gilt Edge" which left immediately after the "Merchants' ". The running time of both trains was five and one-half hours. Buffet club cars were carried on the trains that ran via Waterbury.

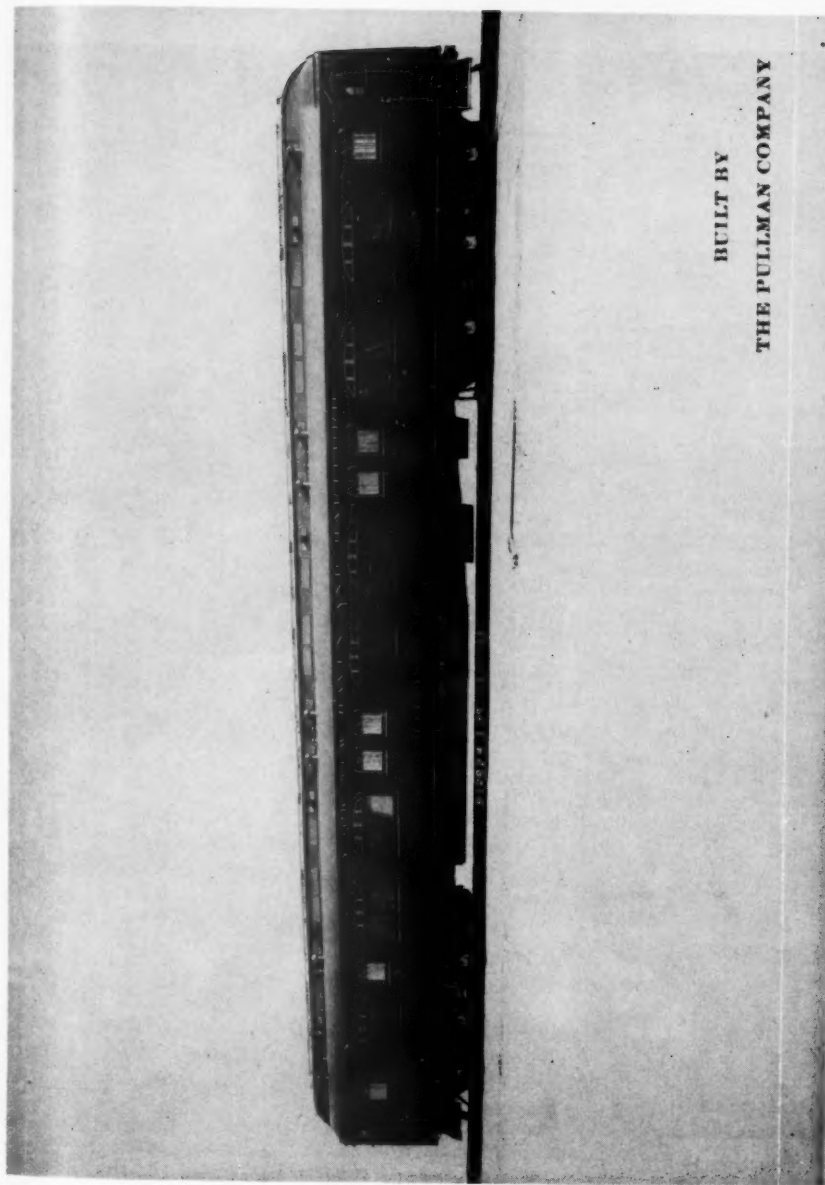
All of these parlor, sleeping and club cars were built by the various builders—Barney & Smith, Jackson & Sharp, Wagner, Pullman and many were built in the New Haven Shops. Plate glass windows set them apart from the coach equipment. The parlor cars had large picture windows, the sleeping cars had smaller windows—two to a berth. Some had colored glass above the window. In many instances they were tailored to fit the service requirements of a certain train. If the standard Pullman parlor car seated 26 passengers, the 1903 classification book of the New Haven shows that altho' some of the older cars built by Barney & Smith in 1882 seated only 20 passengers, some of those built by Pullman in 1903 for the New Haven seated 34 passengers and, of the 93 cars owned at that time, there were at least ten different seating capacities of these cars. Sleeping cars had a capacity of from 26 to 32 passengers. On January 1, 1913 arrangements were made with the Pullman Company to operate the parlor and sleeping cars on the New Haven. Some of the innovations have been retained during these years but the equipment supplied by Pullman was based on their own standards.

For many years the overnight trains from both New York and Washington arrived in ample time for breakfast and the first trains left after that meal hour. In order to serve the other two meals it required some juggling in the matter of the "diners." Generally, these cars were cut in and cut out as needed and sometimes a car was cut out before those who preferred to dine late were ready for it. For example, the 10:03 A. M. from Boston to New York had its "diner" cut out at New Haven at 2:00 P. M. but the dining car on the 1:02 P. M. New York to Boston which was cut out at New London was added to the 3:00 P. M. New York to Boston, thus serving luncheon and dinner on two trains in the same direction. Perhaps the cars that made the most impression on this writer were a group built by the Pullman Co. in 1907 with large windows, rounded at the top with colored glass above the window and inside, along the sill, a space was provided for the placing of ferns or flowers. At that time one could obtain a good meal for a dollar and I'm afraid I was more interested in the meal than the car furnishings.

The Pullman Company gradually replaced all of the club, parlor and sleepings cars with their own, built of steel, and the former New Haven cars were scattered over the country. Similarly, the New Haven replaced their own equipment with that of steel, assigning them first

to the Shore Line trains. Some of the ex-Shore Line wooden equipment came to Taunton, was sent down on the Cape and to other places resulting in better equipment—all vestibuled. The steel equipment was safer—no one denies that but, after being out in the hot sun all day in the Dover Street Yards, the cars were something like ovens when backed into the South Station. This applied to the “Fall River Line Boat Train” that arrived early and left late.

The end of the wooden equipment was in sight and with it went the art and skill of the cabinet maker, the copper sheathed coaches, the brakeman climbing up to light the Pintsch gas lamps in the smoker, the several and many varieties of cars that we knew so well and which we noted in our youth.



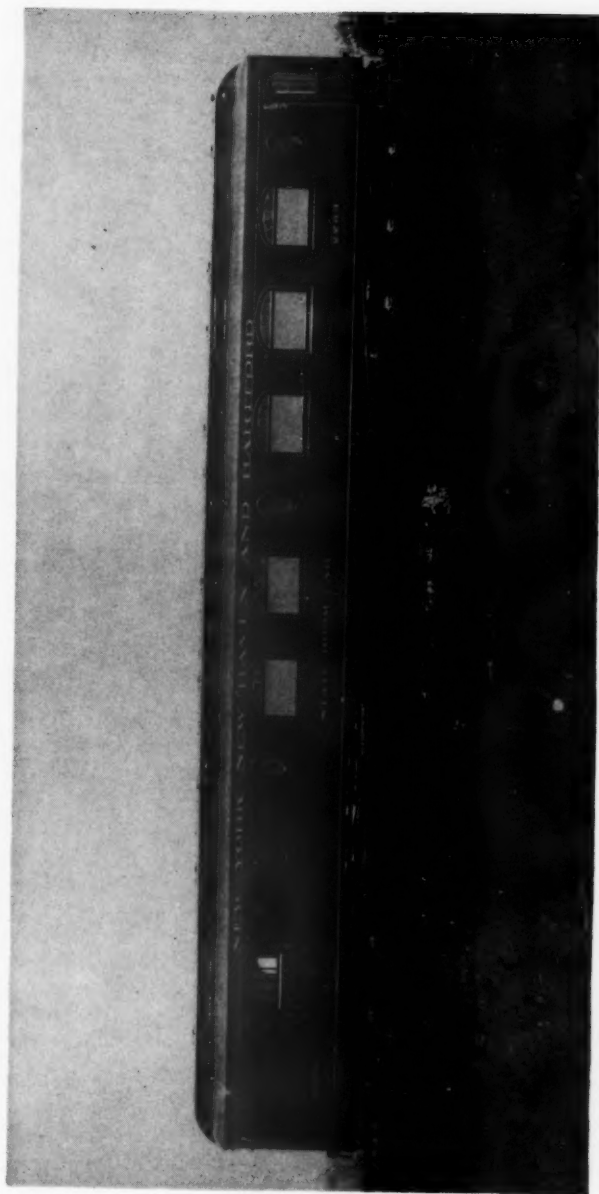
N. H. #2056. Pullman Co. One of the "brass bed" cars.

Courtesy of Arthur D. Dublin.



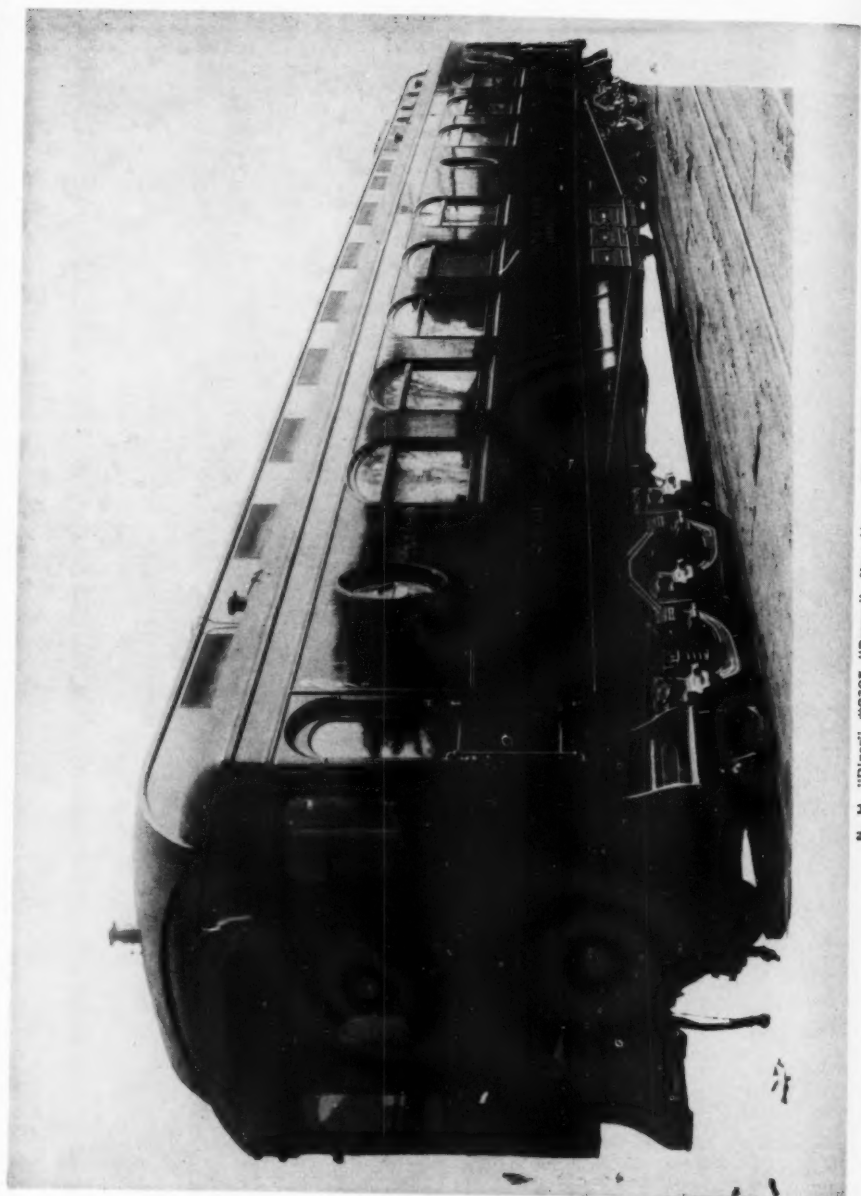
Courtesy of Arthur D. Dubl.

Interior of one of the staterooms of the "brass bed" cars.



Courtesy of Arthur D. Dublin.

N. H. Stateroom Car #2263, Pullman Parlor Car Co. 1900.



N. H. "Diner" #2303 "Bronx," New Haven Shops 1903.

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The Santa Fe in the Southwestern United States

A Paper read before our Southern California Chapter by J. G. Fry,
Chief Engineer—Coast Lines, A. T. & S. Fe Ry. April, 1960.

As early as 1830 some people envisioned a carrier to link the established east with the undeveloped west, but not until about 1845 was the movement given serious consideration. There were serious discussions in Congress from 1845 to 1852, and finally, as a result of these discussions, Congress was induced to have the army make the so-called Pacific Railroad Surveys covering five possible routes from the Mississippi to the Pacific. It directed that one survey be through the northern area, one approximately along what became the Central-Pacific-Union Pacific area, another about on the mountain passage of the Rio Grande Company, another through northern New Mexico and Arizona, and another close to the Mexican border. The results, published in 1856, demonstrated that transcontinental railroads could be built along as many routes as the traffic warranted.

In 1866 Congress passed a bill granting a Federal charter incorporating the Atlantic and Pacific Railroad. It authorized construction of a continuous line from Springfield, Missouri, through Albuquerque, along the 35th parallel to the Colorado River, and then by the most practical and eligible route to the Pacific.

To aid construction the United States gave the railroad a right of way with additional space where stations or shops proved necessary,—all exempt from taxation in the territories. More important, it authorized the company to earn a land grant, justified as necessary to encourage a route for the mail and the military, of alternate odd-numbered sections for 20 miles on either side of the line in the states and 40 miles in the territories.

The Atlantic and Pacific law of 1866 also authorized the Southern Pacific Railroad of California to build eastward from San Francisco to a junction with the 35th parallel route near the state boundary, and as encouragement offered the opportunity to earn a similar land grant. The building of the Atlantic and Pacific started shortly after 1866 and by 1872 it had acquired sufficient information about the territory beyond Vinita, (now in Oklahoma) to file with the government a map of definite location for its route as far as San Francisco. The United States accepted these maps, and after serious financial troubles, along with the panic of 1873, the Atlantic and Pacific defaulted on its bond payments in that year, and two years later plunged into bankruptcy. In 1876 a group of bondholders purchased the completed road and adjacent land grant, forming a new corporation entitled the St. Louis and San Francisco, the so-called Frisco. This new company retained control of the original charter, valuable for both its authority to build west and its land-grant provisions.

The Santa Fe, as far back as 1870, had its eye on the New Mexico-Arizona route, or what is commonly called the 35th parallel which extended from Fort Smith, Arkansas to the Tehachapi Pass and San Francisco.

By 1880 the Santa Fe's tracks had reached Albuquerque, New Mexico. It then turned south to connect with the Southern Pacific's transcontinental line at Deming. With the Frisco, which now used the mileage to Vinita and still owned the 1866 Federal charter, it shortly joined in reviving the Atlantic and Pacific. Each would furnish money necessary to construct additional trackage. They agreed in 1880 to build at once the so-called Western Division from Isleta, New Mexico, just south of Albuquerque along the 35th parallel to the Pacific Ocean.

The Frisco and the Atchison divided securities of the revived company between them. Financial difficulties, mostly caused by insufficient traffic, beset the Atlantic and Pacific during the entire time it operated the Western Division. In 1890, with ever increasing financial difficulties facing it, and no cash available, the Atlantic and Pacific liquidated the advances its parents had made for bond interest by giving them title to practically all the surveyed land in its grant. The Western Division was fully acquired by purchase dated June 24, 1897 by the Santa Fe under the foreclosure sale of May 3, 1897 of the railroad property and franchises of the Western Division of the Atlantic and Pacific Railway Company.

This gives us a little of the history of the Santa Fe's line through Arizona. Now for the route between Williams and Crookton.

The grading of this particular track was started in April, 1881 and was completed by the fall of 1882. The track was turned over to the Operating Department in the winter of 1883. The second track was placed between Williams and Ash Fork in 1911, and between Ash Fork and Crookton in 1913. This was one of the most difficult segments of our railroad to locate. We have reviewed the reports of locating engineers and the following excerpts are from the report of Lewis Kingman, dated October 15, 1880, and give us the reasons for the present location:

"I found no difficulty until I reached the slope of the Colorado Plateau, having kept in the direction of Bill Williams Mountain from the point of the Red Mesa deviating only when necessary to overcome some local difficulty in topography or grade.

"From the slope of the Plateau I had great difficulty in finding a practicable route. I examined the break in the Plateau, southerly as far as Hell's Canyon, and I examined the route north and south of Bill Williams Mountain. After reaching the Plateau I could get an easier grade line to the south of Bill Williams Mountain, but the distance would be much longer. I found a possible route down on slope west of Hell's Canyon. My object in this line was to find a good route and keep nearer Prescott without the loss of distance, but I found the Plateau to slope off too quickly for a 2% grade and I was forced to give it up for a shorter line. My next effort was to examine

Johnsons Canyon. This takes the drainage of Bill Williams Mountain from the west side as Hell's Canyon does from the south, and I concluded that this canyon would be in my general direction should I pass to the north of Bill Williams Mountain. My first trip through the canyon disheartened me; but realizing that it was my only chance I made two other examinations before I accepted the situation. At first it seemed impossible to follow the canyon with 10° curves, but a little more familiarity convinced me it could be done, but upon further examination I found the line could be kept out of the canyon on a comparatively smooth slope and only have three or four miles of bad work.

"In summing up these results of my explorations it is perhaps one of the hardest things for one to do to explain fully to another who is not on the ground, why one line is selected in preference to another, but there are many reasons why this route is preferable to any other.

"First: Generally speaking it is the shortest route I can obtain. Second: It presents a better general profile than any other, both as to work and rise and fall.

Third: It has probably much less curvature than any other general route which might be obtained. Mr. Rehrrers report and survey (?) to the contrary notwithstanding.

Fourth: It is nearer Prescott and the business of the country, its mines, population and public roads making it much more accessible.

Fifth: The absence of any long tunnels, it being the natural route.

Sixth: The line probably has less black malpais and lava along its surface than any other that can be obtained. From the Chino Canyon to the end of the hundred miles we necessarily pass over a malpais country—strewn with lava in places, sometimes lime and sandstone, protruding below the malpais as in Johnsons Canyon, but yet nearly always some in sight either as rock in place or loose gravelly fragments in the soil with rolling stones of the same strewn over the surface.

Seventh: As regards water, the chances are probably in favor of this line as it is lower and there are places where it is probable water can be got by digging and in case well water cannot be obtained, there is more drainage tributary to Chino and Partridge Creek from which to obtain supply for reservoirs.

"The three basic reasons for not considering the proposed location to the north were the malpais, the effort to come nearer Prescott and availability of water for locomotives."

The present undertaking of relocation between Williams and Crookton involves a major alteration in the physical characteristics of our transcontinental freight line. This segment is one of the most restrictive, and some of the restrictions are:

- a. Westward freights have 19 miles of track with maximum allowable speeds of 15 to 20 miles per hour, and where passenger trains, allowable speeds are 20 to 30 miles per hour.
- b. The westward track has a canyon wall location down Johnson Canyon for 10 miles.
- c. The westward track has the Johnson Canyon Tunnel on a 10°-6' curve which is one of the most restrictive clearances on our main line. Making it necessary to move many trains from Williams to Welch against traffic on the eastward track. These movements are increasing and the newer Defense hardware may increase the movements still more.
- d. There are about 5,000 degrees of curvature with many 10° curves.
- e. Eastward there is a 1.8% helper grade, Ash Fork to Supai. This is the steepest ruling grade east of Barstow on our freight line.
- f. Welded rail is not practical because of the 10° curves.
- g. Maintenance of Way forces for the most part cannot be motorized.

Early last spring the Board of Directors of the Santa Fe authorized the expenditure of \$19,348,181 and the making of an application to the Interstate Commerce Commission for the authority to construct 44 miles of double track main line railroad between MP 374.9 just east of Williams and MP 418.1 near Crookton. The application was made to the Commission on May 6, 1959 and an order was received from the Commission authorizing the construction on August 4, 1959. Contract was awarded, and construction started on August 28.

This slide shows the Santa Fe lines in the State of Arizona. You can see by the dashed red lines that there are two track relocations, one at the center of the picture,—the Williams to Crookton line change, and the other, lower and to the left, the proposed line change between Abra and Skull Valley.

The Williams to Crookton change will eliminate the sharp curves and maximum grades and has been limited to 1° curves and 1% grades. For your information, 1° curves are curves with a radius of 5,728 feet, over a mile long, and a 1% grade is for a rise or fall of one foot vertically for every 100 feet horizontally.

It is estimated by this line change that we will save one million dollars annually on fuel and maintenance. It is also our estimate that one hour in time for freight trains and approximately 30 minutes for passenger trains will be saved by this construction.

We have a number of slides showing the construction and progress on this line.

Worth Reading

Compiled by

ELIZABETH O. CULLEN, Librarian (Ret.), Bureau of Railway Economics
Library, Association of American Railroads, Washington, D. C.

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Russia and Its Railroads, by Robert G. Lewis. Toronto Railway Club Official Proceedings, March 27, 1961: 13-23.

A Salute to Transportation, by Ross E. Jones. Distribution Age, May 1961: 29-31, 71-72. "Transportation, considered by many to be slow to take up new ideas, is not lagging behind other industries in progress. It is soaring ahead. . . ."

San Francisco through the windows of the White-Front Cars. Market Street Railway, 1934-1937. The Western Railroader, June 1961: 1-12. Illus. Map.

The Schiso Phrenic Nevada Northern, by Donald Sims. Trains, July 1961: 32-35. Illus. "Kennecott Copper's offspring is very busy on one end—operates only every other day on the other."

"Scientific Rates" Win Traffic, by Nancy Ford. Modern Railroads, May 1961: 76-79. Illus., diagr. "Traffic Executive Association researchers constructed new system of rates, not in effect, designed to put railroad service back in demand."

13th Annual Motive Power Survey, by David P. Morgan. Trains, June 1961: 34-37. Illus.

Le Timbre a Sujet Ferroviaire Est Centenaire, La Vie du Rail, 12 Février 1961: 8-9. New Brunswick issued the first postage stamp with a locomotive as principal subject in 1860. How many members of the Society had one in a stamp collection or know who has?

The Traction Unit in Railway Transportation, by C. R. Bennett. Journal of the Institute of Transport, London, Eng., May 1961: 120-123.

The Train They Called the "Rolls-Royce of American Railroadng" by Arthur D. Dubin. Trains, July 1961: 20-31. Illus., diagrs. "The Pioneer Limited", CMStP & P.

Trains Goes Round the World—2. "The great affair is to move"—on Beyer—Garratts on Rhodesian, Portuguese East African and South African Railways. Illus. Maps of Africa and of Rhodesian Railways. Trains, March 1961: 30-36. 3. "For heavy slogging service on steep grades"—The Union of South Africa's topography turned the land into a locomotive paradise. April 1961: 35-51. Illus. 4. "The railway is the beginning of all history in Kenya. . . These railwaymen here in Africa are not railwaymen only, they are really the bearers and guarantors of our civilization"—Sir Edward Grigg. May 1961: 36-41. "... East African Railways is a completely isolated meter-gauge (3-foot 3 $\frac{3}{8}$ -inch) system of 3398 route-miles serving the territories of Kenya, Uganda, and Tanganyika. EAR owns the world's largest and most powerful meter-gauge steam locomotive, paints its engines red, climbs to the highest altitude reached by rail in the British Empire, and is a mountain railroad by virtue of 4 per cent grades . . ." 5. [East African Railways, concluded]. June 1961: 44-48; 6. . . . *India—Where wide-open O-40T's disturb the nocturnal solitude of the Himalayas*. Map of 2-ft-gauge Darjeeling-Himalayan Ry., with "scenery" showing it and the mountains by Gil Reid. July 1961: 46-51. 7. . . . *Australia*, especially New South Wales. August 1961: 24-29. 8. . . . *New Zealand*. . . September 1961: 34-38.

Transport Treasures, by John H. Scholes. The Journal of Transport History, London, Eng., May 1961: 22-32. Illus.

Transportation: The \$50-Billion Battle—Special Report to Management, prepared under the direction of Thomas Kenny. Dun's Review and Modern Industry, June 1961: 40-133. I. Rails: War on Two Fronts. II. Piggyback: Who Gets the Bacon? III. Trucking: The High Road and the Low. IV. Shippers: Rolling Their Own Payoff. V. Air Freight: Off to the Wild Blue Yonder. VI. Water Carriers: Slow but Steady and Sure.

Travel Tribulations of 1875, by Mary C. Wiley. The State, Raleigh, N. C., September 17, 1960; 13, 35. "Calvin Wiley Diary reveals difficulty of getting around North Carolina."

The Truck-Trains Open the Throttle. Condensed from Quest by J. C. Furnas. Reader's Digest, June 1961: 114-117. Illus. "By 'piggy-backing' trailers the railroads have found a way to increase their sagging revenues. But the more trailers they haul, the more they risk war with their bitter rivals—the truckers."

Twenty Five Years of LaGrange. Diesel Railway Traction, May 1961: 202-204. "Some features in the active life of the world's largest diesel locomotive building plant."

Two Kar-Flos, One Rotary RR Dumper at Pacific Port. Link-Belt News, March-April 1961: 1,6. "Unusual railway-marine operation transfers many types of bulk materials from railroad cars to ships."

The Union - Postal Clerk and The Postal Transport Journal, v. 57, no. 9, September 1961. "ANOTHER FIRST - What could be more appropriate than the Labor Day Weekend for the birth of THE UNION POSTAL CLERK AND THE POSTAL TRANSPORT JOURNAL!"

Visalia Railroads, by Joseph E. Doctor. The Western Railroader, April 1961: 1-12.

West Virginia—Last Stand of Steam, by Thomas A. Lear. National Railway Historical Society Bulletin, Third Quarter, 1961: 8-11. Illus.

Western Pacific Motive Power—Locomotive Rosters, compiled by Sy Reich. Railroad Magazine, April 1961: 60.

What Should Railroads Do About Research? Modern Railroads, June 1961: 131-132. An interview with Dr. O. M. Solandt, CNR, by Frank Richter.

Where To Ride Behind Steam? by Jim Scribbins. Trains, June 1961: 15-19. "Dear Reader: In answer to your recent request. Sincerely, The Editor."

Which Road for Transportation—Private Management, or . . . ? Traffic World, August 19, 1961: 35-38. Interview with Gerald W. Collins, Mgr. Transportation & Communications Dept., Chamber of Commerce of the United States, August 26, 1961.

New Books

Rails West, by George B. Adbill. 191 pages, 11½ x 8½. Illustrated. Published by Superior Publishing Co., 2809 Third Ave., Seattle (11), Washington. Price \$12.50

This is the third volume from this author and it is in keeping with "This Was Railroading" and "Pacific Slope Railroads". Here again the author has told his story by means of illustrations and this is one of the surest ways of telling the story. This book takes us to the railroads of Colorado and to the Pacific Coast, to Texas, Oklahoma and the southwest and to the Central Plains states including such railroads as the "Q", Wabash and others. In addition to the credit due the author for his efforts, credit should also be given to the collectors, many of whom are members of this Society, for digging into their collections and furnishing photographs for the illustrations. Generosity of this nature is fully appreciated by this reviewer in that they are shared by all. Many of these illustrations appear for the first time and all are of interest. There is enough text to form a setting for each section and the description that accompanies each illustration is full and complete and the story is told right at that point.

This volume is in keeping with the two predecessors and will be a valuable addition to any library or collection.

Railroads in the Woods, by John T. Labbe and Vernon Coe. 269 pages, 11 x 8½. Illustrated. Published by Howell-North Books, 1050 Parker St., Berkeley (10), California. Price \$10.00.

The logging railroads were built right to the timber line and hauled out the logs formerly hauled out by horses. Grades were steep, trestles were spidery and the track could be moved from one location to another. Standard types of locomotives were used and, in addition to these we had the Shay, Heisler and Climax types for good measure. They were slow but they were certain. And railroading was entirely different than "main line" railroading. This work is a documented and authoritative account of the many ramifications of the logging railroads, especially in the Pacific Northwest. There are over 400 illustrations that add to the clarity of the story and to the facts. This is a record of an era that will never come again! Yes, logging operations were vastly different from those of our public carriers and this book is an interesting account of their operation and the many devices that were used in their operation. I'm sure that many of our members will want a copy of this volume.

The Interurban Era, by William D. Middleton. 432 pages, 11½ x 8. Illustrated. Published by Kalmbach Publishing Co., 1027 North 7th St., Milwaukee (3), Wisconsin. Price \$15.00.

This book traces the interurban from its birth in Oregon in 1893 to its final demise about three decades later. Yet in those three decades the interurban grew and flourished in our midst, especially in the states of Ohio, Indiana and Illinois. Death came via the rubber tired vehicle

and the paved highway. To those of us who saw some of our interurban lines in their glory and who enjoyed breezing along at about a mile-a-minute with the windows open in the summer time, it was far more exciting than driving an automobile. Yes, there were parlor and dining cars and on the McKinley lines out of St. Louis there were sleeping cars with innovations never found on a Pullman. These interurbans not only carried passengers but they handled express matter and some carried the U. S. Mail. The interurban united neighboring cities and gave the residents of the countryside in between a chance to enjoy urban facilities and society.

The book is divided into geographic groups, giving the facts, photographs and individualities of the interurbans in the U. S., Canada, Cuba and Mexico. Certain systems, such as the Illinois Traction, the Insull lines and Pacific Electric Ry. are allowed an entire chapter to include all of the details. There were various types of cars and equipment, they were as distinctive as the individual but, one thing they had in common—the trolley wire.

There is a chapter on "Wrecks and Other Mishaps", the better known Interurban Carbuilders, types of rolling stock, "Trolley Freight," and "Electric Railway Museums in the U. S. and Canada." There are 560 illustrations that help tell the story in no other way.

In Bulletin No. 103 we reviewed the book—The Electric Interurban Railways in America, by George W. Hilton and John F. Due. This book and the present one under review are the two best sources of interurban railway history in America. One supplements the other and, if one is interested in this form of transportation both volumes should be a "must" for the individual.

Steam Locomotive and Railroad Tradition published by our member, William S. Young, Box #158, Susquehanna, Pa., is a lively little publication published every two months and contains much of interest to the "steam fan." The June, 1961 issue has an article on "Steam in Colorado and where to find it" and an article on "Ireland's Last Narrow Gauge." Other notes and illustrations make up the 28 page "consist." Subscription price \$4.75 per annum. Also, once a year is published the "Short Line Annual", 24 pages, illustrated which serves as a guide to the 478 short-line railroads in the U. S. and Canada. Price \$1.00 per copy.

In Memory of

DANIEL O. MCKELLIPS

Annual Member

4734 Edgewood Ave., Oakland(2), Calif.

Who Died on July 6, 1961

THOMAS O. MORSE

Annual Member

7017 Cedros Ave., Van Nuys, Calif.

Who Died on March 11, 1961

PAUL EILENBERGER

Annual Member

4778 Cromwell Ave., Los Angeles, Calif.

Who Died on August 7, 1961

